TDP-P5 Service Manual

FILE NO. 330-200207

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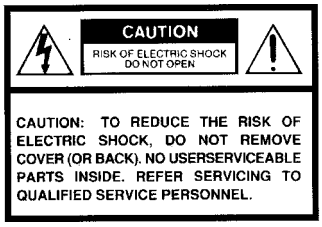
SAFETY PRECAUTIONS



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDETHE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIRED PERSONNEL ONLY.

CAUTION: Laser beam is emitted when the laser button of the remote control is pressed. Do not look from the front of the remote control. Do not face toward a person or to a mirror.

FCC Radio Frequency Interference Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiates radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING: Changes or modifications made to this equipment, not expressly approved by Toshiba, or parties authorized by Toshiba, could void the user's authority to operate the equipment.

Notice: This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

IMPORTANT PRECAUTIONS

Save Original Packing Materials

The original shipping carton and packing materials will come in handy if you ever have to ship your LCD projector. For maximum protection, repack the set as it was originally packed at the factory.

Avoid Volatile Liquid

Do not use volatile liquids, such as an insect spray, near the unit. Do not leave rubber or plastic products touching the unit for a long time. They will mar the finish.

Moisture Condensation

Never operate this unit immediately after moving it from a cold location to a warm location. When the unit is exposed to such a change in temperature, moisture may condense on the crucial internal parts. To prevent the unit from possible damage, do not use the unit for at least 2 hours when there is an extreme or sudden change in temperature.

In the spaces provided below, record the Model and Serial No. located at the rear of your LCD projector.

Mode No._____ Serial No. _____

Retain this information for future reference.

IMPORTANT SAFETY INSTRUCTIONS

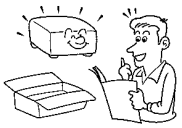
CAUTION: PLEASE READ AND OBSERVE ALLWARNINGS AND INSTRUCTIONS GIVEN IN THIS OWNER'S MANUAL AND THOSE MARKED ON THE UNIT. RETAIN THIS BOOKLET FOR FUTURE REFERENCE.

This set has been designed and manufactured to assure personal safety. Improper use can result in electric shock or fire hazard. The safeguards incorporated in this unit will protect you if you observe the following procedures for installation, use and servicing. This unit is fully transistorized and does not contain any parts that can be repaired by the user.

DO NOT REMOVE THE CABINET COVER, OR YOU MAY BE EXPOSED TO DANGEROUS VOLTAGE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.

1. Read Owner's Manual

After unpacking this product, read the owner's manual carefully, and follow all the operating and other instructions.



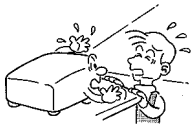
2. Power Sources

This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company.

For products intended to operate from battery power, or other sources, refer to the operating instructions.

3. Source of Light

Do not look into the lens while the lamp is on. The strong light from the lamp may cause damage to your eyes or sight.



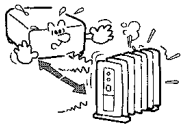
4. Ventilation

Openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

IMPORTANT SAFETY INSTRUCTIONS

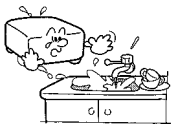
5. Heat

The product should be situated away from heat sources such as radiators heat registers, stoves, or other products (including amplifiers) that produce heat.



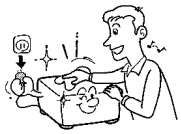
6. Water and Moisture

Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool and the like .



7. Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

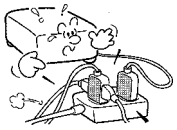


8. Power-Cord Protection

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

9. Overloading

Do not overload wall outlets; extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.



10. Lightning

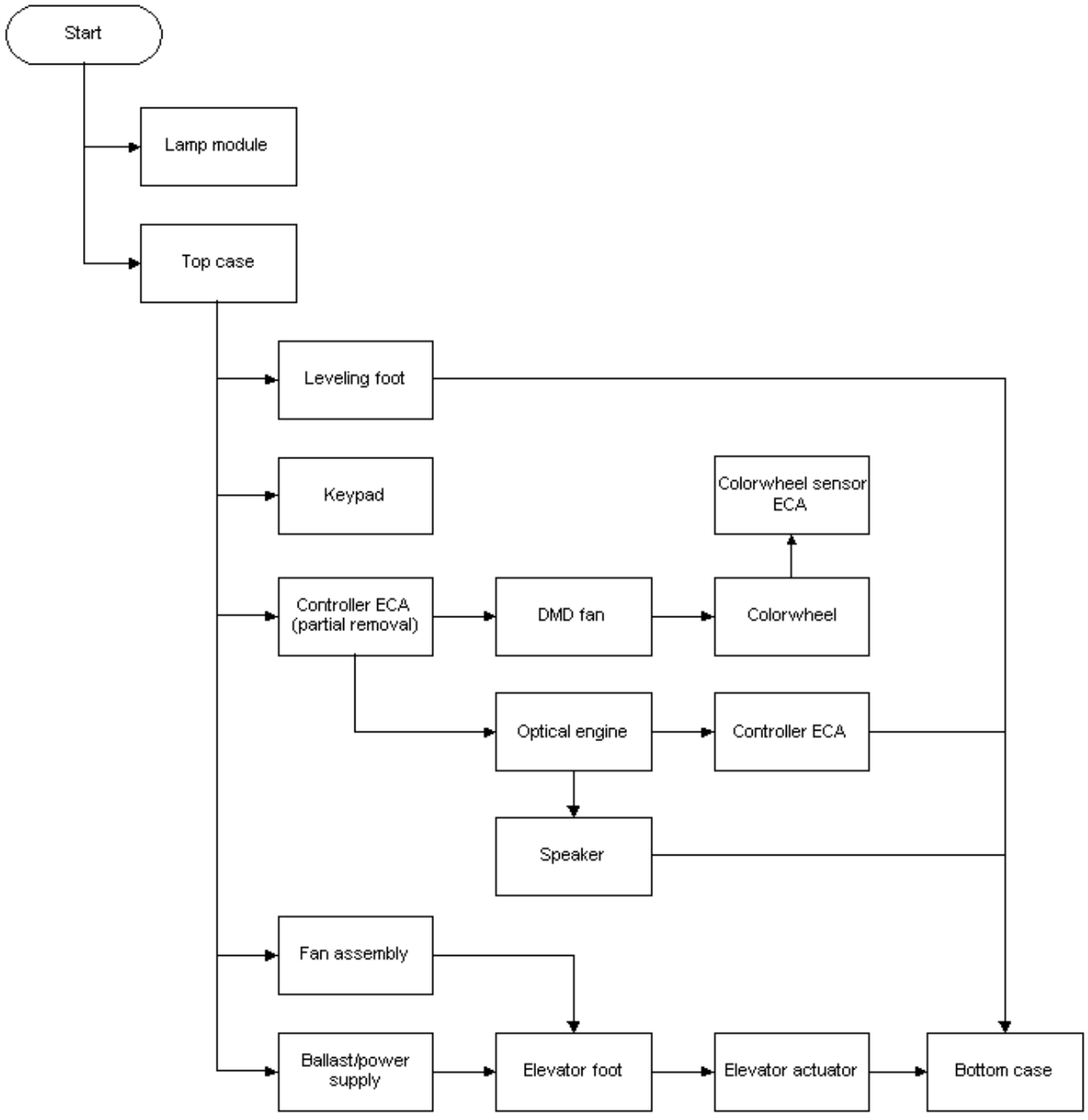
For added protection for this product during storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet.

This will prevent damage to the product due to lightning and power-line surges.

Parts Replacement

Replaceable Part Hierarchy

The flow chart below shows what parts must be removed to access each replaceable part in the projector. The parts on the first level (the lamp module, for example) are accessible without removing any other parts. The more levels down that a part is, the more parts you need to remove in order to access it.



Remove and Replace the Lamp Module

The **lamp module** is located on the bottom of the projector and includes an integrated lamp door.

DANGER Allow the lamp module to cool before removing it from the projector. High operating temperatures inside the lamp house can cause burns. Do not attempt to measure the output voltage from the ballast when the lamp strikes. High voltage produced by the ballast to strike the lamp can ruin test instruments as well as cause personal injury.

1. Place the projector upside down on the work surface.
2. Remove the three M3x6 screws that fasten the lamp to the bottom case.

3. Use a small flat blade screwdriver to gently pry up the edge of the lamp door, then pull the lamp module out of the projector.

Assembly Notes

- Torque the three M3x6 screws to 5.3 in-lbs (0.6 Nm).
- If you install a new lamp, you need to reset the lamp counter.

    1. Turn the projector on, then press Menu on the remote control or the keypad.
    2. In the Basic menu, select Setup.
    3. In the Setup menu, select Service.
    4. In the Service menu, select Reset Lamptimer.

Remove and Replace the Top Case

The **top case** encloses the top half of the projector.

1 Remove the three M2.5x41.5 Plastite screws from the bottom case.

2 Turn the projector right side up on the work surface.

3 Gently lift the side of the top case.

When you have lifted the top case far enough, the three tabs on the opposite side of the top case disengage from the slots in the bottom case.

4 Gently lift the top case away from the bottom case.

Assembly Notes

- Ensure that the three tabs on the side of the top case fully engage the slots in the bottom case.
- Torque the three M2.5x41.5 Plastite screws to 5.3 in-lbs (0.6 Nm).

Remove and Replace the Leveling Foot

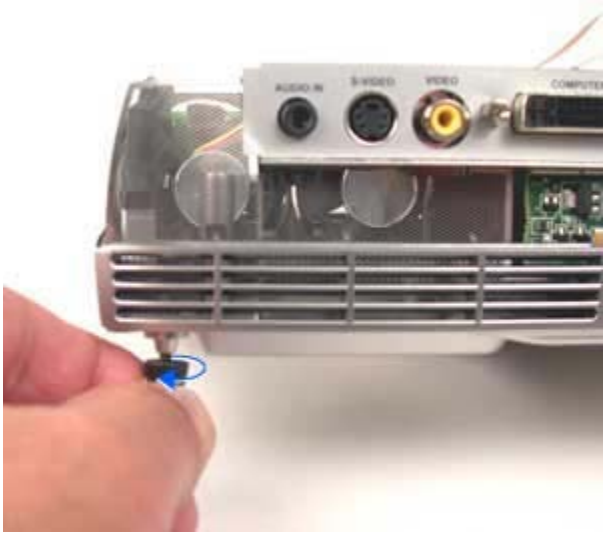
The **leveling foot** extends from the bottom case and controls the horizontal tilt of the projected image.

The **leveling foot retainer** stops the leveling foot at its maximum extension.

NOTE A new leveling foot does not include a retainer. The leveling foot retainer is not reusable once you remove it from the leveling foot.

1. Fully retract the leveling foot into the bottom case.
2. Remove the lamp module (page 7) and the top case (page 9).
3. Gently pry the leveling foot retainer from the groove around the top of the leveling foot.

4. Extend the leveling foot until it separates from the bottom case.



Assembly Notes

- Fully retract the leveling foot into the bottom case before replacing the leveling foot retainer.
- Use a short section of 1/8" pipe to allow straight placement of the leveling foot retainer on the leveling foot. Tap the pipe gently to seat the retainer into the groove around the top of the leveling foot.

Remove and Replace the Keypad

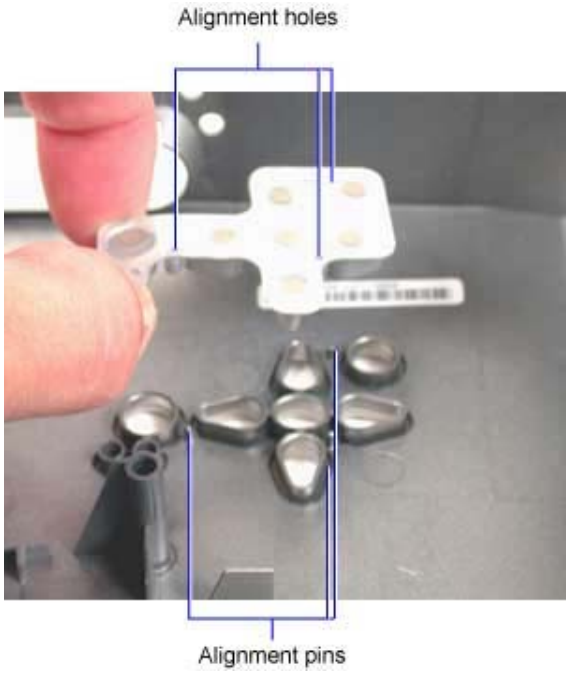
The **keypad** fastens to the inside of the top case. Pressing a key causes a conductive surface on the bottom of the keypad to contact the controller ECA and register the activity. The keypad is a single assembly. It includes the key set and two light pipes that conduct light signals through the top case from the projector status and lamp status LEDs on the controller ECA.

1 Remove the top case (see page 9)

2 Gently peel the keypad away from the inside of the top case.

Assembly Notes

- Ensure that the three alignment pins on the inside of the top case fully engage the holes in the keypad.



- Press the keypad down firmly to secure it in the top case.

Remove and Replace the Fan Assembly

The **fan assembly** provides cooling for the lamp module and electrical components inside the projector. The assembly consists of two 50mm fans in a mounting frame. Each fan uses a three-wire cable that relays a locked rotor condition to the controller ECA if a motor fails.

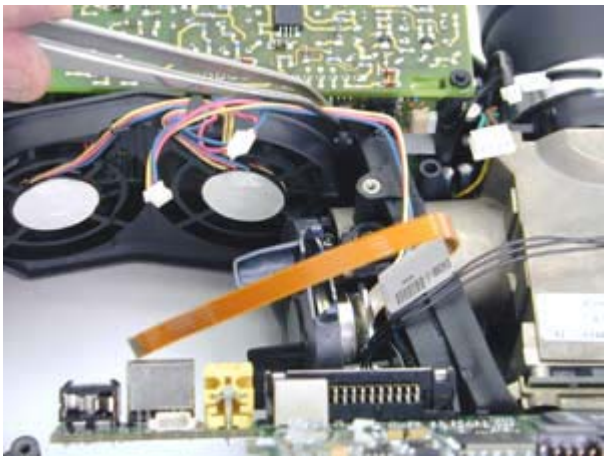
1 Remove the following items:

Lamp module (see page 7)

Top case (see page 9)

Controller ECA (partial removal) (see page 16)

2 Disengage the DMD fan cable from the guide on top of the fan assembly.



3 Disengage the high voltage lamp cable from the guide at the side of the fan assembly.

4 Lift the fan assembly from the guides in the bottom case.

Assembly Notes

- Ensure that the fan assembly engages the guides in the bottom case.
- Route the high voltage lamp cable through the guide at the side of the fan assembly.
- Route the DMD fan cable through the guide at the top of the fan assembly.

Partially Removing the Controller ECA to Access Other Parts

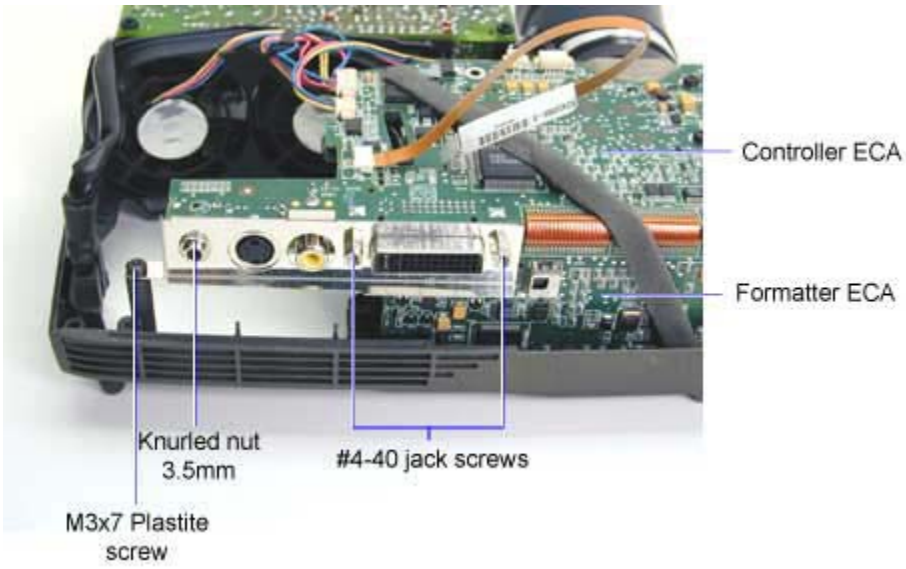
The controller ECA covers many of the internal components in the projector. The controller connects to the formatter ECA with three flexible ribbon cables. When you lift the controller ECA, these ribbon cables act as hinges to allow access to components beneath the controller ECA. The formatter ECA remains connected to the optical engine allowing stable hinge action. Use this procedure to lift the controller ECA and swing it out of the way while you access components inside the projector.

1 Remove the following items:

Lamp module (see page 7)

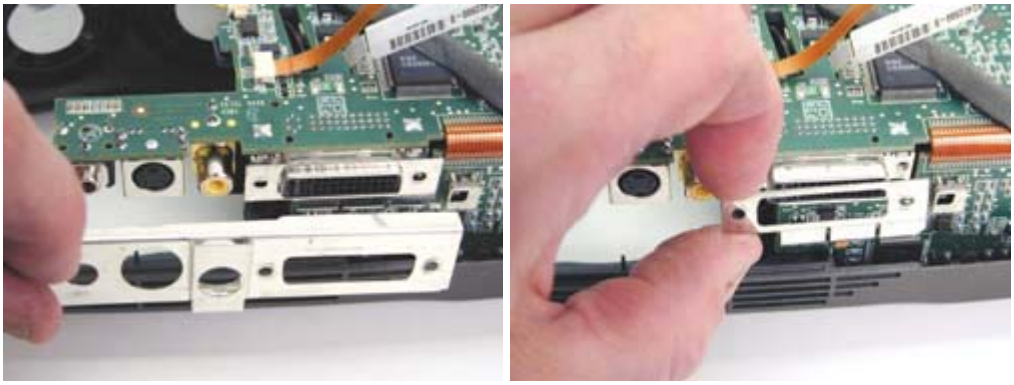
Top case (see page 9)

2 Remove the fasteners that secure the I/O shield to the bottom case and the controller ECA.

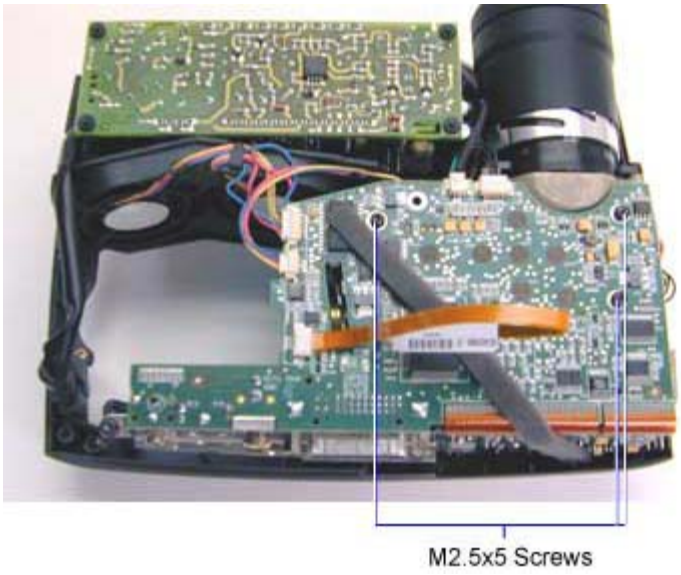


Place the fasteners aside. Each of the fasteners is also available in the **hardware kit** (see page 83).

3 Remove the I/O shield and the M1 connector shield from the controller ECA.

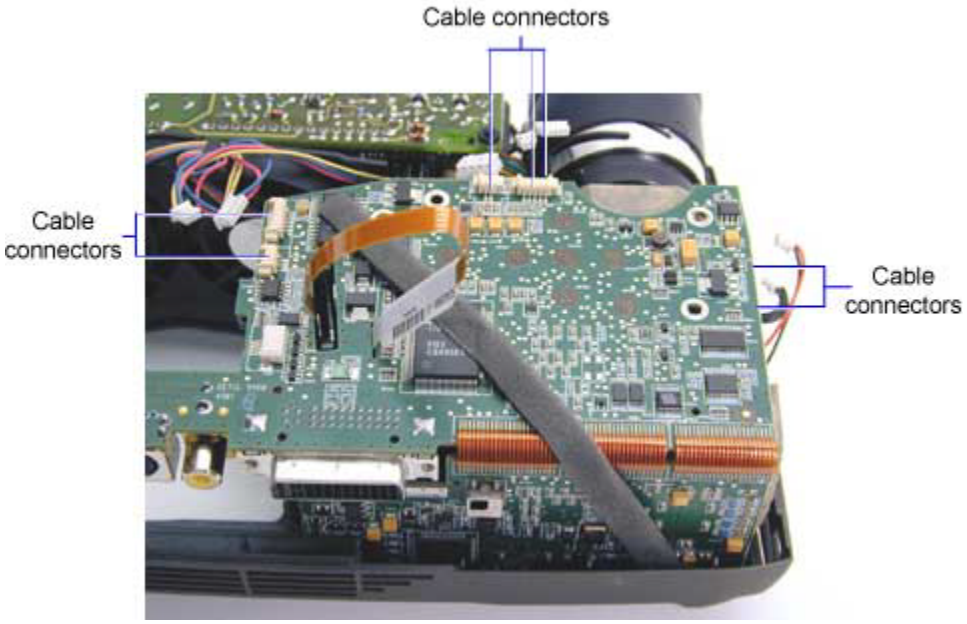


4 Remove the three M2.5x5 Torx screws that fasten the controller ECA to the optical engine.



5 Unplug the color wheel ribbon cable from the ZIF connector on the controller ECA.

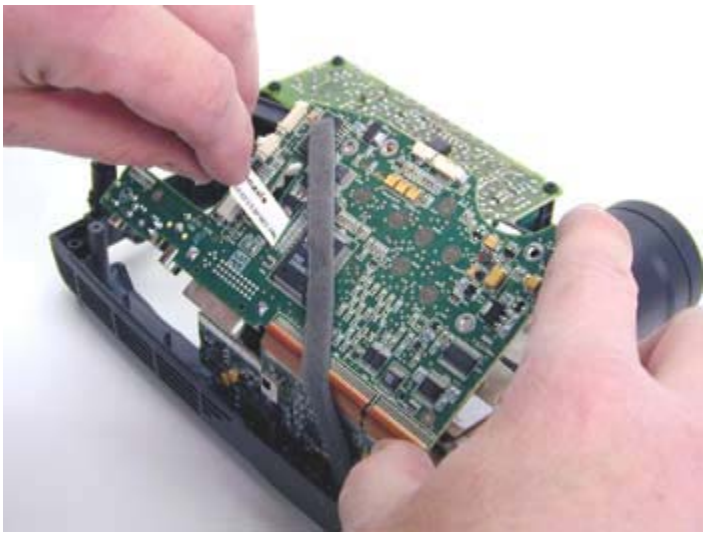
6 Unplug the seven cables that connect to the outside edge of the controller ECA.



7 Carefully lift the front side of the controller ECA upward until it is perpendicular to the projector.

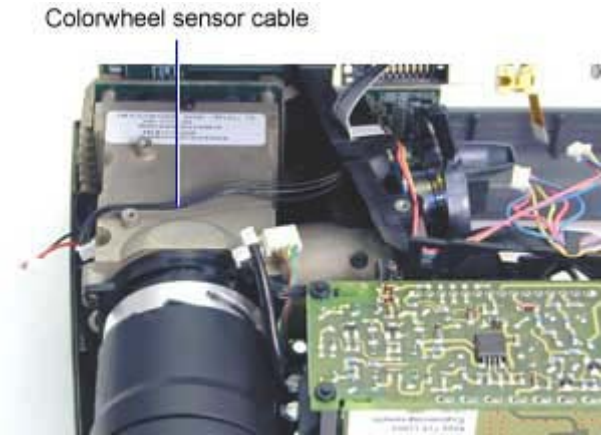
NOTE As you lift the controller ECA, feed the color wheel ribbon cable through the slot in the board. Feed the entire length of cable through the slot.

Don't remove the foam airflow gasket from the controller ECA.



Assembly Notes

- When you replace the M1 connector shield, ensure that the metal tabs at the bottom of the shield slant toward the projector.
- Route the color wheel sensor cable over the top of the optical engine, avoiding pinch points at screw locations.



- Torque the three M2.5x5 Torx screws to 5.3 in-lbs (0.6 Nm).
- Torque the M3x7 Plastite screw to 6.2 in-lbs (0.7 Nm).
- Torque the #4-40 jack screws to 3.5 in-lbs (0.4 Nm).

Remove and Replace the DMD Fan

The **DMD fan** provides cooling for the DMD at the rear of the optical engine. A mounting frame with rubber flanges surrounds the 45mm fan. The fan uses a three-wire cable that relays a locked rotor condition to the controller ECA if the motor fails.

1 Remove the following items:

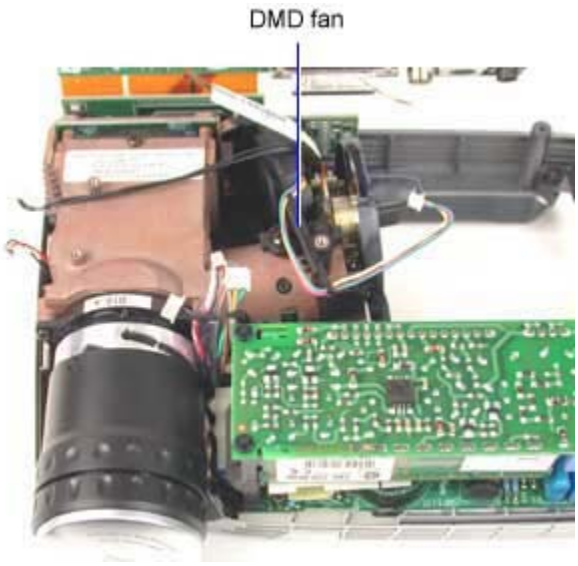
Lamp module (see page 7)

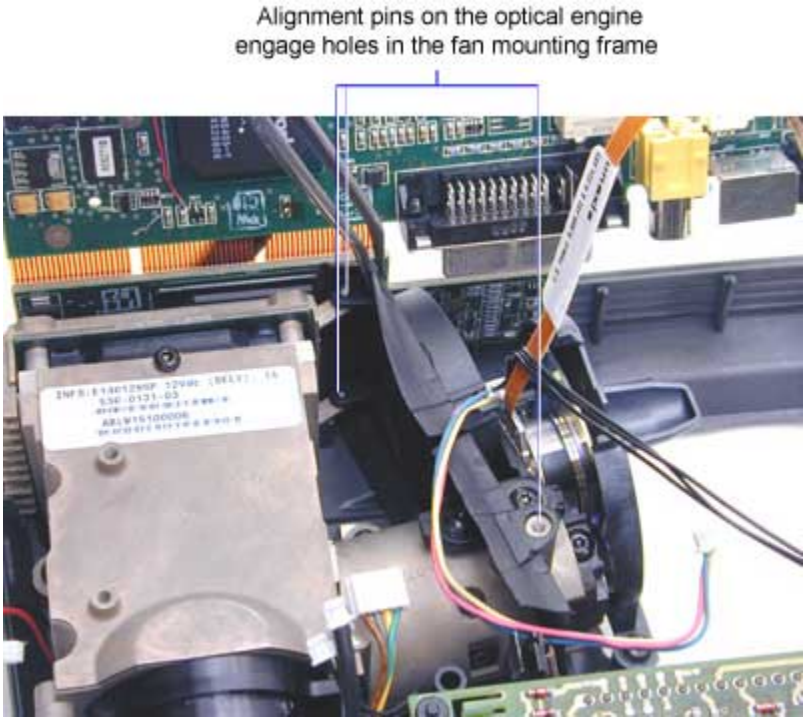
Top case (see page 9)

Fan assembly (see page 14)

Controller ECA (partial removal) (see page 16)

2 Lift the DMD fan from the alignment pins on the optical engine.





Assembly Notes

- Ensure that the alignment pins on the optical engine engage the holes in the fan mounting frame.

Remove and Replace the Color Wheel

The **color wheel** provides necessary degrees of image color saturation. The color wheel motor receives power through the attached ribbon cable to rotate the 50mm, 4-segment glass color wheel.

DANGER Avoid touching the glass color wheel. The outer edge of the color wheel is sharp and can cause personal injury.

NOTE Touching the side surfaces of the color wheel can leave fingerprint smudges that degrade the image. The color wheel is fragile. Handle it by the mounting bracket. While the color wheel is removed from the projector, protect it against dirt and materials that could scratch the glass.

1 Remove the following:

Lamp module (see page 7)

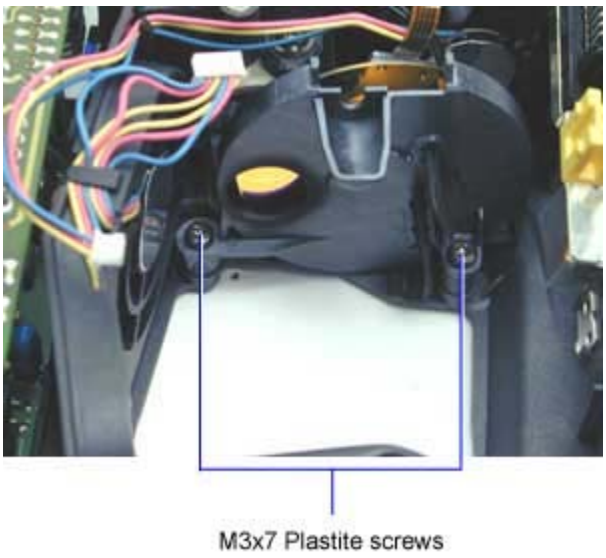
Top case (see page 9)

Fan assembly (see page 14)

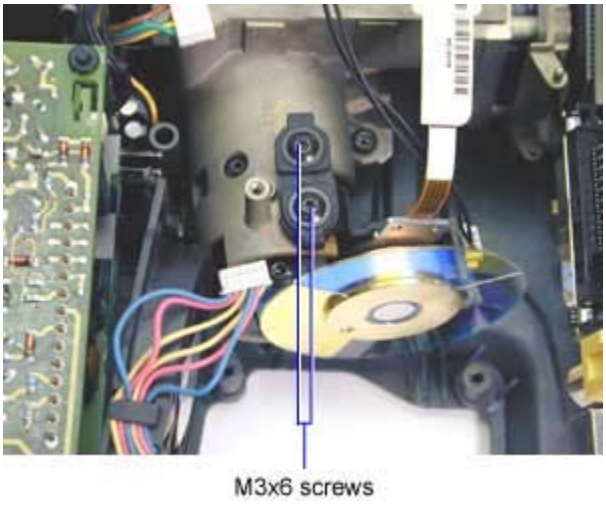
Controller ECA (partial removal) (see page 16)

DMD fan (see page 20)

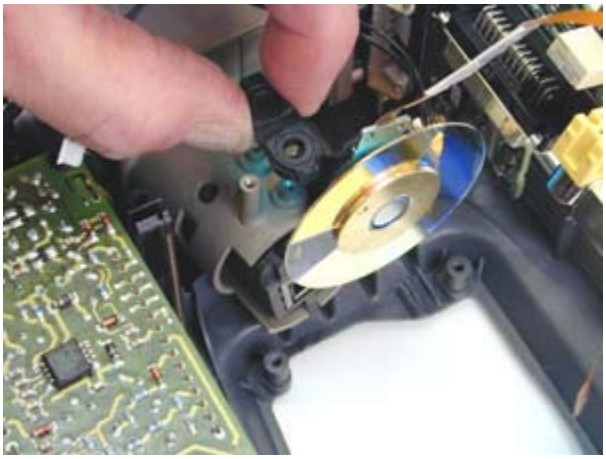
2 Remove the two M3x7 Plastite screws that secure the color wheel shield to the bottom case. Then carefully lift the shield away from the color wheel. Place the shield aside for use with the replacement color wheel. The shield is also available in the **hardware kit** (see page 83).



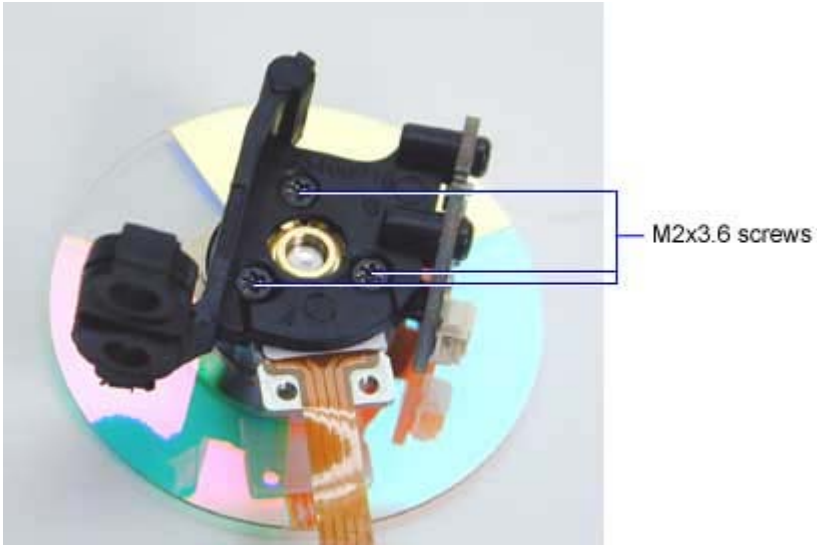
3 Remove the two M3x6 screws that fasten the color wheel mounting bracket to the optical engine.



4 Carefully lift the color wheel by the mounting bracket to remove it from the optical engine.



5 Remove the three M2x3.6 screws that secure the color wheel to the mounting bracket. Separate the two parts. Save the mounting bracket for use with the replacement color wheel.



Assembly Notes

- Ensure that the color wheel ribbon cable aligns with the recess in the mounting bracket.
- Torque all screws to 5.3 in-lbs (0.6 Nm).

Remove and Replace the Color Wheel Sensor ECA

The **color wheel sensor ECA** detects and processes a pulse stream from the rotating color wheel hub and transmits the signal through the **color wheel sensor cable** to the controller ECA.

1. Remove the following:

   Lamp module (see page 7)

   Top case (see page 9)

   Controller ECA (partial removal) (see page 16)

   DMD fan (see page 20)

   Color wheel (see page 22).

2. Unplug the color wheel sensor cable from the color wheel sensor ECA.

3. Remove the two M2.5x5 Plastite screws that secure the color wheel sensor ECA to the color wheel mounting bracket.

Assembly Note

- Torque the two M2.5x5 Plastite screws to 6.2 in-lbs (0.7 Nm).

Remove and Replace the Optical Engine

The **optical engine** produces the projected image. It fastens to the bottom case and produces the image by directing focused light from the lamp module through the color wheel and onto the Digital Micromirror Device (DMD). The formatter ECA, located directly behind the optical engine, performs final signal processing before the image information is delivered to the DMD. The formatter ECA connects to the controller ECA with three flexible ribbon cables.

A new optical engine includes a color wheel, color wheel sensor ECA and projection lens.

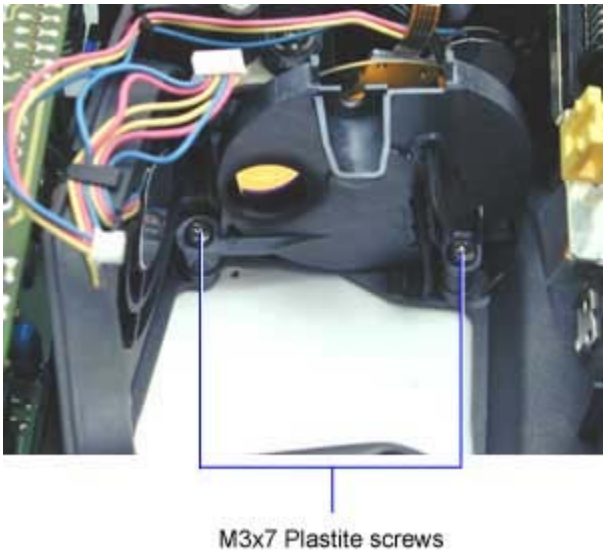
1. Remove the following items:

   Lamp module (see page 7)

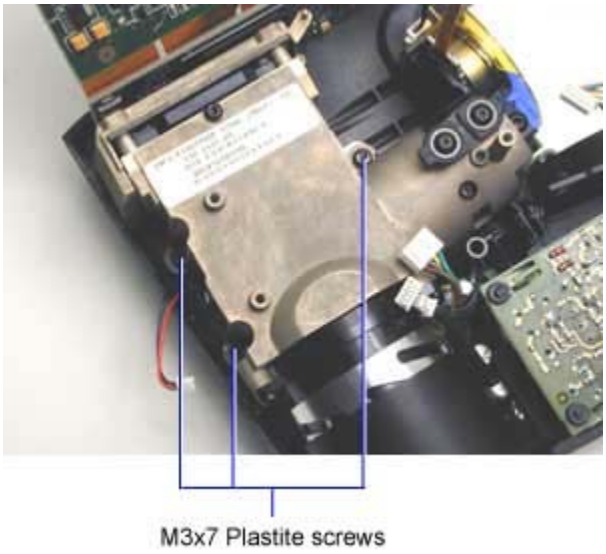
   Top case (see page 9)

   Controller ECA (partial removal) (see page 16)

2. Remove the two M3x7 Plastite screws that secure the color wheel shield to the bottom case. Then carefully lift the shield away from the color wheel.



3 Remove the three M3x7 Plastite screws that secure the optical engine to the bottom case.



4 Carefully lift the optical engine and attached controller ECA from the bottom case.

5 If you need to replace the optical engine, remove the controller ECA (see page 28).

Assembly Notes

- Ensure that the speaker cable is not pinched between the bottom of the optical engine and the bottom case.
- Torque the M3x7 Plastite screws to 5.3 in-lbs (0.6 Nm).

Remove and Replace the Controller ECA

The **controller ECA** includes the controller and the formatter boards. The two boards fasten to each other with three flexible ribbon cables. The formatter ECA plugs into a connector at rear of the optical engine adjacent to the DMD. In addition to processing input signals from the remote control and keypad, the controller provides all control functions and processes the data and video signals. A foam gasket on the controller ECA provides airflow control to aid cooling inside the projector. The formatter ECA provides final-stage signal processing required by the DMD.

If you need to remove the controller ECA to access a part beneath the board, see *Partially Removing the Controller ECA to Access Other Parts* (see page 16).

NOTE A new controller ECA includes a foam gasket to control cooling airflow. Do not remove the gasket.

1. Remove the following items:

   Lamp module (see page 7)

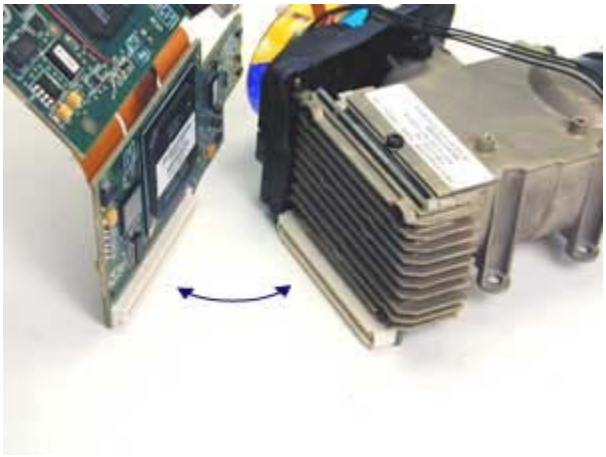
   Top case (see page 9)

   Controller ECA (partial removal - see page 16)

   Optical engine (see page 26)

2. Gently pry the formatter ECA away from the optical engine until one side of the connector opens.

3 Pull the formatter ECA away from the optical engine.



Assembly Notes

- Press firmly on the connector between the optical engine and the formatter ECA to ensure that it fully engages.
- The replacement controller ECA may not contain current product software. Check the software version by navigating to the service menu. Then select “Info” to see the currently installed software version. Upgrade the software if necessary (see page 47).

Remove and Replace the Speaker

The **speaker** fastens to the bottom case. The 200mW, 8-ohm speaker uses a Mylar diaphragm to direct sound through a grill opening molded into the bottom case.

1 Remove the following items:

Lamp module (see page 7)

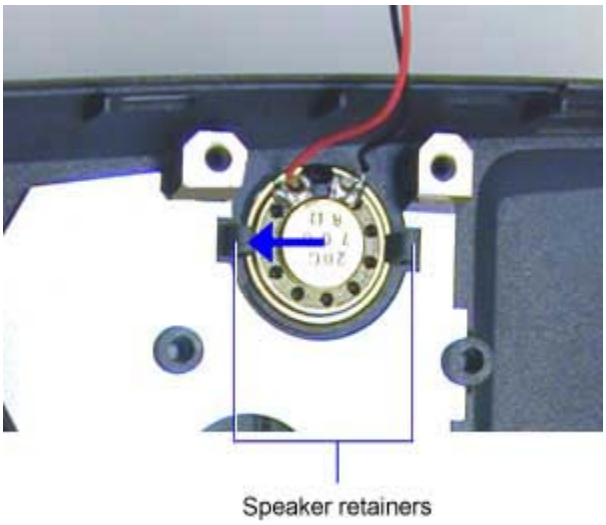
Top case (see page 9)

Controller ECA (partial removal) (see page 16)

Optical engine (see page 26)

2 Gently compress one of the speaker retainers on the bottom case. Compress the retainer just enough to clear the edge of the speaker.

NOTE The retainers are fragile. Avoid excessive force to compress them.



3 With the retainer compressed, use a small flat blade screwdriver to pry the speaker away from the bottom case.

4 Lift the speaker away from the bottom case. The speaker disengages from the opposing retainer.

Assembly Notes

- Position the speaker in the bottom case with the wire leads pointing toward the side of the case.
- Press the speaker down against the bottom case. The speaker is secure when both of the retainers snap into place over the ridge around the edge of the speaker.

Remove and Replace the Ballast/Power Supply

The **ballast** attaches to top of the **power supply** with plastic retainer rivets on standoffs. Providing high voltage to strike and operate the lamp through the **lamp cable**, the ballast receives primary power from the power supply. The **lamp control cable** connects the ballast with the controller ECA. When the controller ECA detects proper operation of all projector systems at startup, it sends a signal to the ballast through the lamp control cable to strike the lamp.

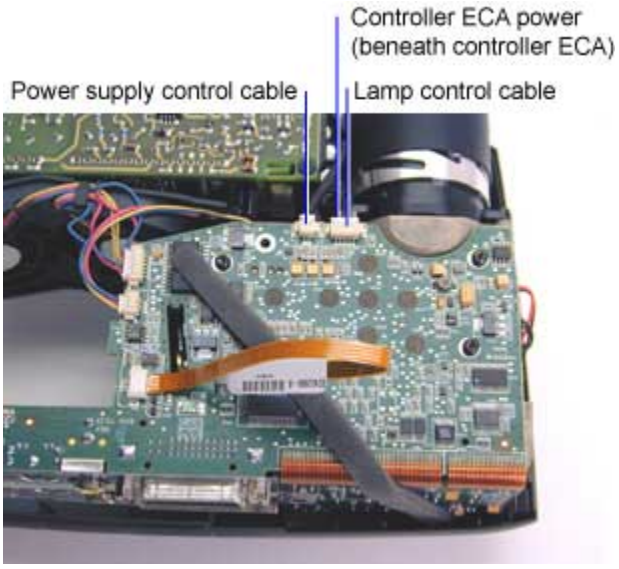
The power supply includes the AC plug and provides low voltage to the controller ECA, the optical engine and the fans.

1. Place the projector upside down on the work surface.

   Remove the lamp module (see page 7).

   Remove the top case (see page 9).

2. Unplug the lamp control cable, the power supply control cable and the controller ECA power cable from their connectors on the controller ECA.

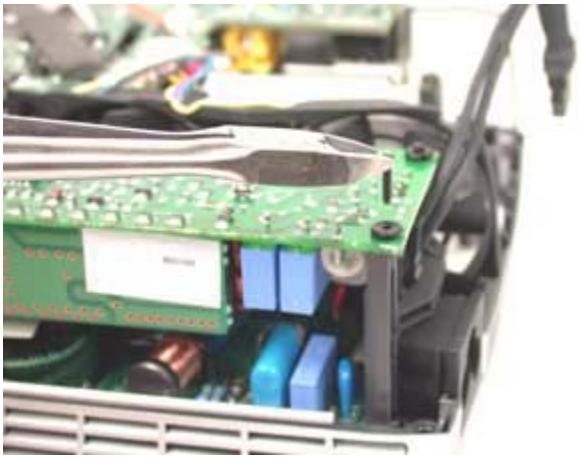


3 Disengage the high voltage lamp cable from the guide at the side of the fan assembly.

4 Squeeze the retainer tabs on the lamp connector together to unlock it from the recess in the bottom case. Pull the connector out of the recess.

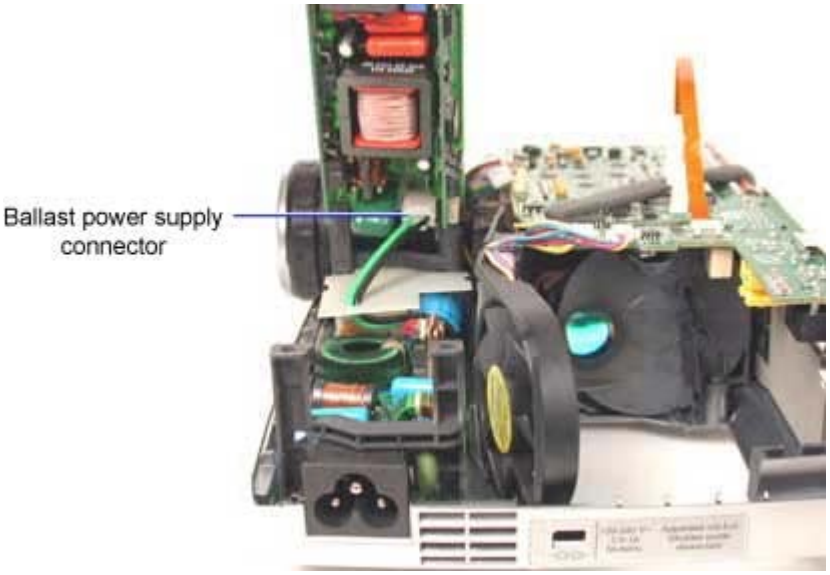
Remove the ballast

1 Remove the center pin from each of the four plastic retainer rivets at the corners of the ballast.



2 Lift and remove each of the four retainer rivets at the corners of the ballast.

3 Lift the ballast away from the power supply. Then squeeze the locking tab on the ballast power supply connector and unplug the connector from the power supply.

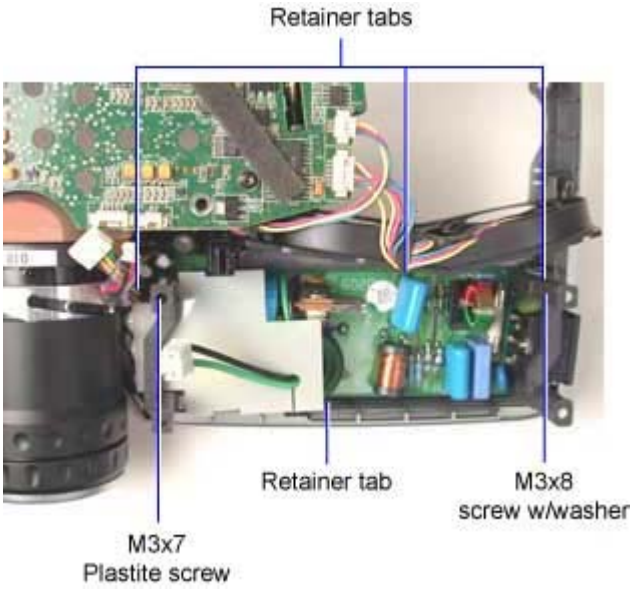


4 Squeeze the locking tab on the lamp cable connector and unplug the connector from the ballast.

5 Unplug the lamp control cable from the ballast.

Remove the power supply

1 Remove the M3x7 Plastite screw and M3x8 screw with washer that secures the power supply to the bottom case.



2 Gently pry the retainer tab nearest the rear of the projector away from the power supply.

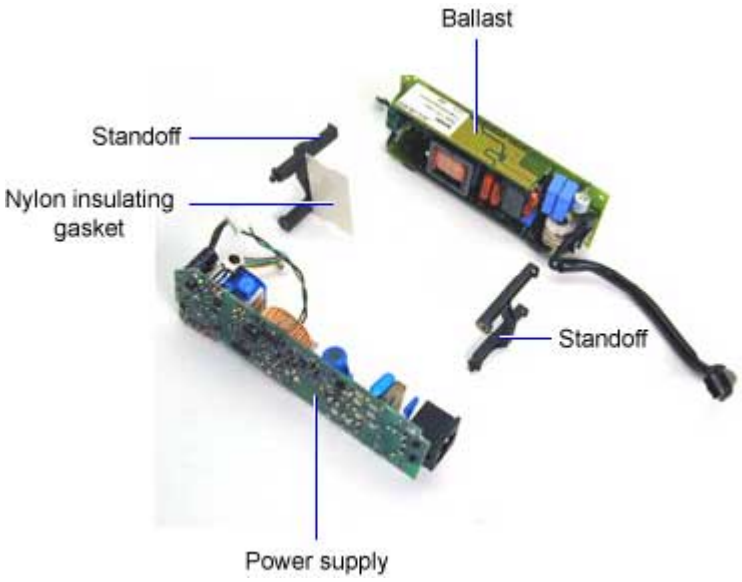
NOTE The retainer tabs are fragile. Use as little force as possible to release them.

3 Lift the power supply and check to see if any other retainer tabs prevent its removal. If other retainer tabs fail to release, gently pry them away from the power supply.

4 Lift the power supply away from the bottom case.

5 Remove the standoffs from the power supply. Pull them to release the snap connectors. Save the standoffs for use with the replacement power supply.

NOTE A nylon insulating gasket snaps onto the standoff nearest the projection lens. The gasket provides insulation between the power supply and ballast. The gasket is available in the **hardware kit** (see page 83).



Assembly Notes

- Make sure the grooves in the AC plug engage the slots in the bottom case when you replace the power supply.
- Make sure that each retainer tab engages the power supply.
- Use the M3x8 screw with washer at the end of the power supply closest to the side of the bottom case. Use the M3x7 Plastite screw at the end of the power supply closest to the projection lens.

Remove and Replace the Elevator Foot

The **elevator foot** extends from the bottom case. The **elevator spring** provides tension to retract the elevator foot. A new elevator foot does not include the spring.

1. Fully extend the elevator foot from the bottom case.
2. Remove the following items:

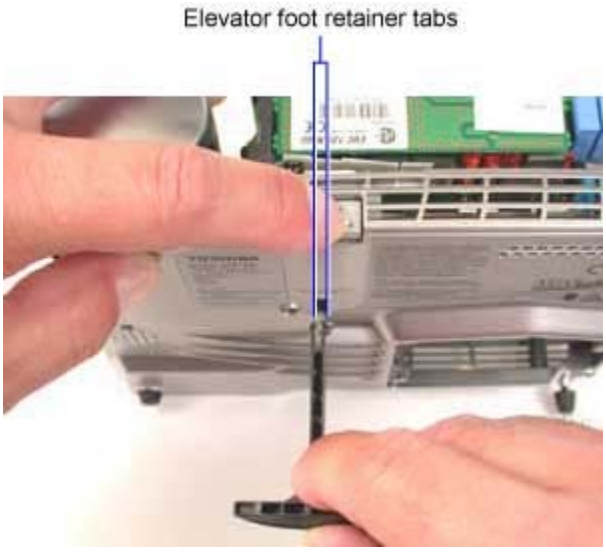
   Lamp module (see page 7)

   Top case (see page 9)

   Fan assembly (see page 14)

   Controller ECA (partial removal) (see page 16)
3. Remove the elevator spring from the notch in the top of the elevator foot. Avoid disengaging the opposite end of the elevator spring from the bottom case.

4. While pinching the elevator foot retainer tabs tightly together, depress the elevator actuator and pull the elevator foot out of the bottom case.



Assembly Notes

- Depress the elevator actuator before inserting the elevator foot into the bottom case.
- Once you insert the elevator foot into the bottom case, leave the foot fully extended until you attach the elevator spring.

Remove and Replace the Elevator Actuator

The **elevator actuator** controls operation of the elevator foot. A tooth on the actuator engages teeth on the elevator foot shaft to prevent movement at an adjusted position. Pressing the actuator disengages the tooth from the elevator foot shaft allowing elevator adjustment.

The **elevator actuator spring** forces the tooth on the actuator to engage the teeth on the elevator foot shaft. A new elevator actuator does not include the spring.

1. Remove the following items:

   Lamp module (see page 7)

   Top case (see page 9)

   Fan assembly (see page 14)

   Controller ECA (partial removal) (see page 16)

   Optical engine (see page 26)

   Ballast/power supply (see page 30)

   Elevator foot (see page 38)

2. Lift the EMI shield from the bottom case. Place the shield aside for use with the replacement elevator actuator. The shield is also available in the **hardware kit** (see page 83).

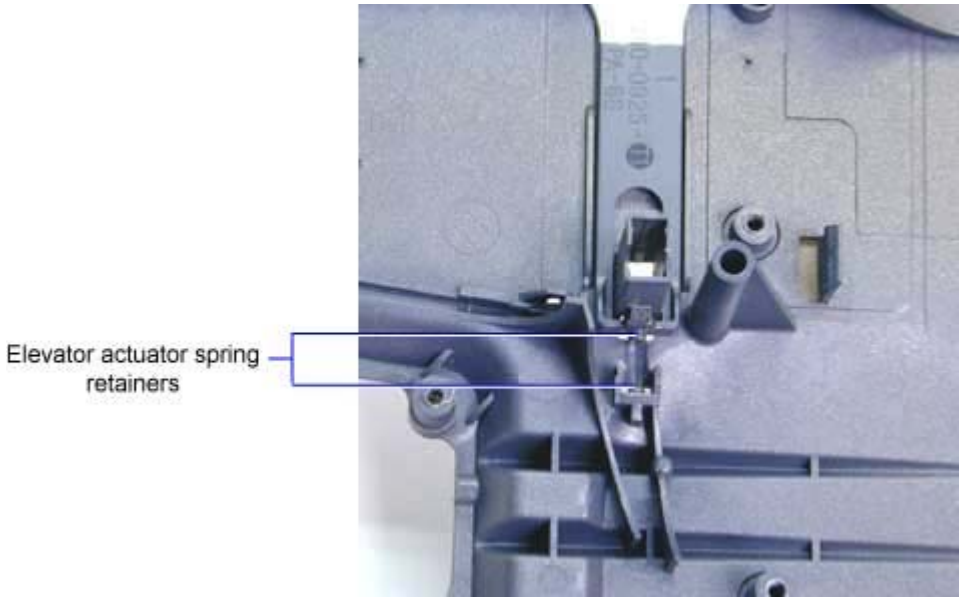
3. Use a small flat blade screwdriver to compress the elevator actuator spring. Then remove the spring from the bottom case.

4 Depress the elevator actuator to disengage it from the bottom case.

5 Lift the elevator actuator away from the bottom case.

Assembly Notes

- Replace the elevator actuator before installing the actuator spring.
- Compress the spring using a small flat blade screwdriver. Then position the spring ends over the retainers before releasing compression.



Remove and Replace the Bottom Case

The **bottom case** encloses the bottom half of the projector. When you replace the bottom case, you must obtain a new **bottom case label kit** and **rubber foot**. The label kit contains all labels for the bottom case.

1 Remove the following items:

Lamp module (see page 7)

Top case (see page 9)

Leveling foot (see page 11)

Fan assembly (see page 14)

Controller ECA (partial removal) (see page 16)

Optical engine (see page 26)

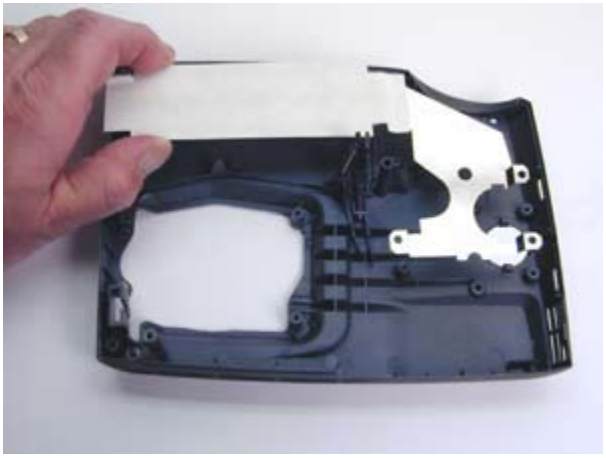
Speaker (see page 30)

Ballast/power supply (see page 32)

Elevator foot (see page 38)

Elevator actuator (see page 40)

2 Lift the EMI shield from the bottom case. Place the shield aside for use with the replacement bottom case. The shield is also available in the **hardware kit** (see page 83).



Assembly Notes

- When you replace the bottom case, remove the product serial number label from the old bottom case. You can use a heat gun or hair drier to loosen the serial number label from the certification label. Take care not to ruin the label by applying too much heat. Attach the serial number label to the new bottom case.

- Adhere labels (certification, power rating and model labels) to the bottom case. Also adhere the rubber foot to the bottom case.

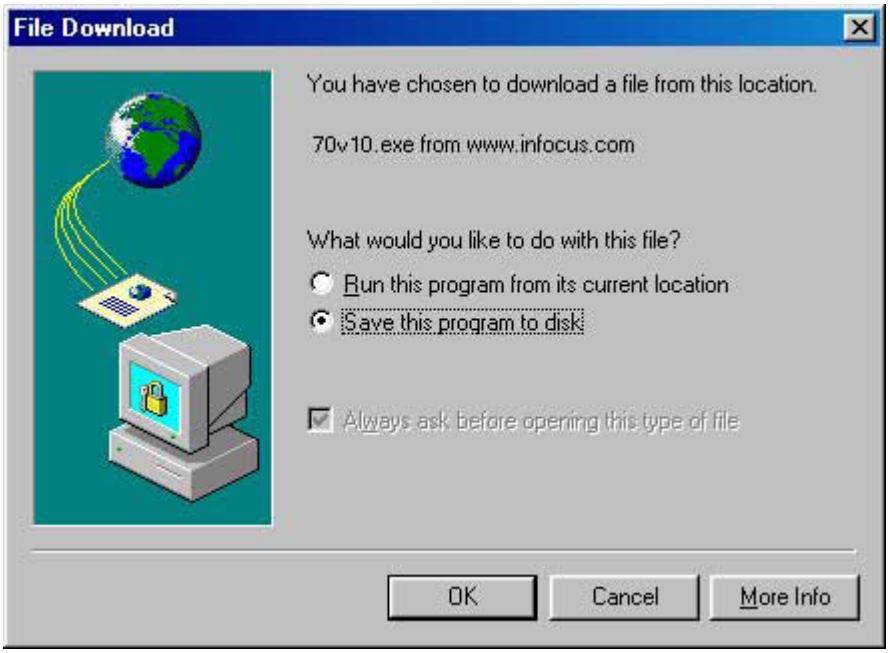
Software

Download the software to your computer

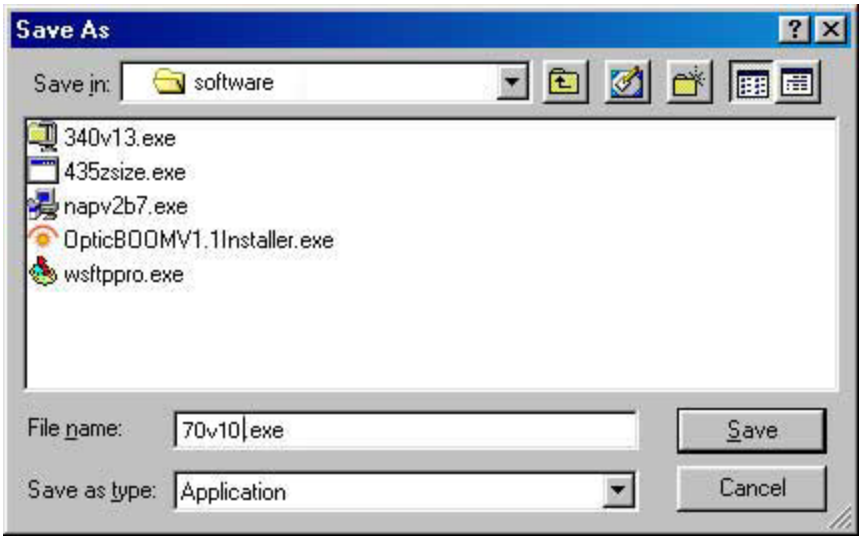
When you click the download button on the projector software web page, the File Download dialog box appears.

NOTE The illustrations below refer to version 1.0 of the projector system software. The version of the software you download may be different.

1 In the File Download box, select Save This Program To Disk option, then click OK.



2 In the Save As dialog box, navigate to the folder in which you temporarily want to store the .EXE file, then click OK. When you open this file later, it will automatically place the upgrade files in a specific folder.



The file downloads to your computer's hard drive. Now you're ready to install the software on the computer. You can also transfer the file to a floppy disk to use on other computers.

To install the system software on the computer, see the next page.

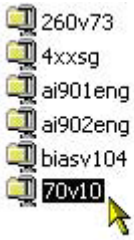
Install the Software on the Computer

The software you download is bundled into one .EXE file. You open the .EXE file and install the upgrade software on the computer you plan to use to flash the projector.

1 Open Windows Explorer on your computer.

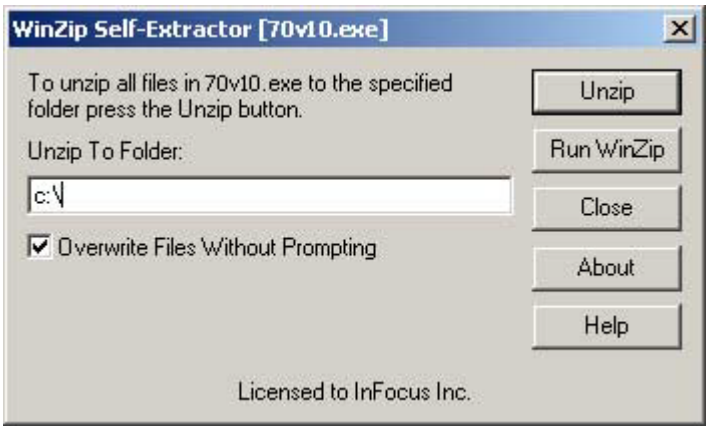
To do this, click the *Start* button, point to *Programs*, then click *Windows Explorer*.

2 In Windows Explorer, locate the .EXE file that contains the upgrade files. Double-click the file to extract the contents.



The filename 70v10.exe means that this is build 1.0 of the system software for the projector. The build number changes each time a new software version becomes available.

3 The WinZip Self-Extractor dialog box appears. Leave the folder choice as c:\. WinZip extracts the files to a new folder on your hard driver (c:\LP70\v1.0, for example).



NOTE If you can't find the file, use the Windows Find feature to locate the file. On the Tools menu, point to Find, then click Files or Folders. In the Find dialog box, enter the name of the file (for example, *70v10.exe*).

4 To extract the files, click *Unzip*. Click OK in the message box that appears, then click *Close*.

Now you're ready to upgrade the software in the projector. See the next page.

Upgrade the software

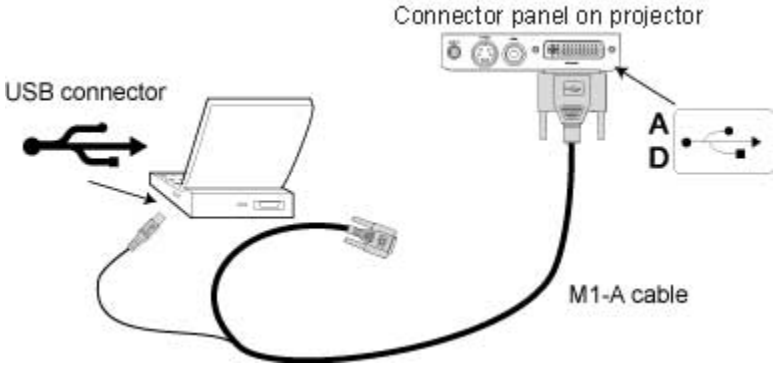
To upgrade the projector software, you need the following:

- M1-A cable that comes with the projector
- A computer with an available USB port

Connect the projector to the computer

1 Connect the M1-A cable to the M1 port on the projector. Then plug the USB connector on the other end of the cable into an available USB port on the computer.

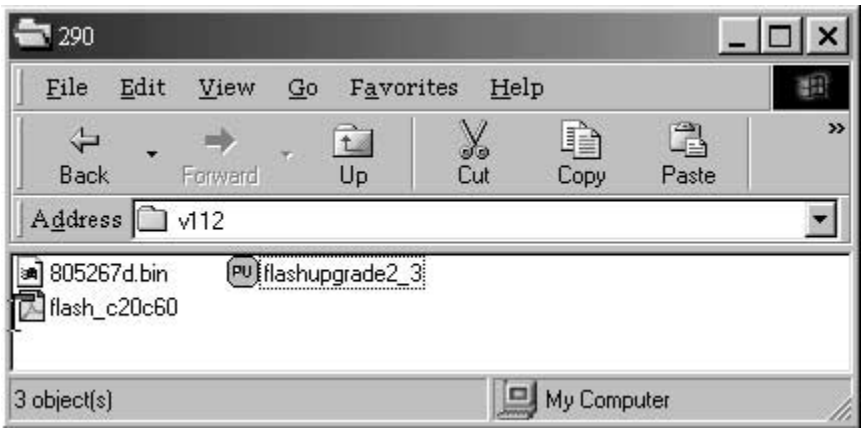
NOTE Do not attach the power cord on the projector yet. If the cord is plugged in at this stage the upgrade will not start.



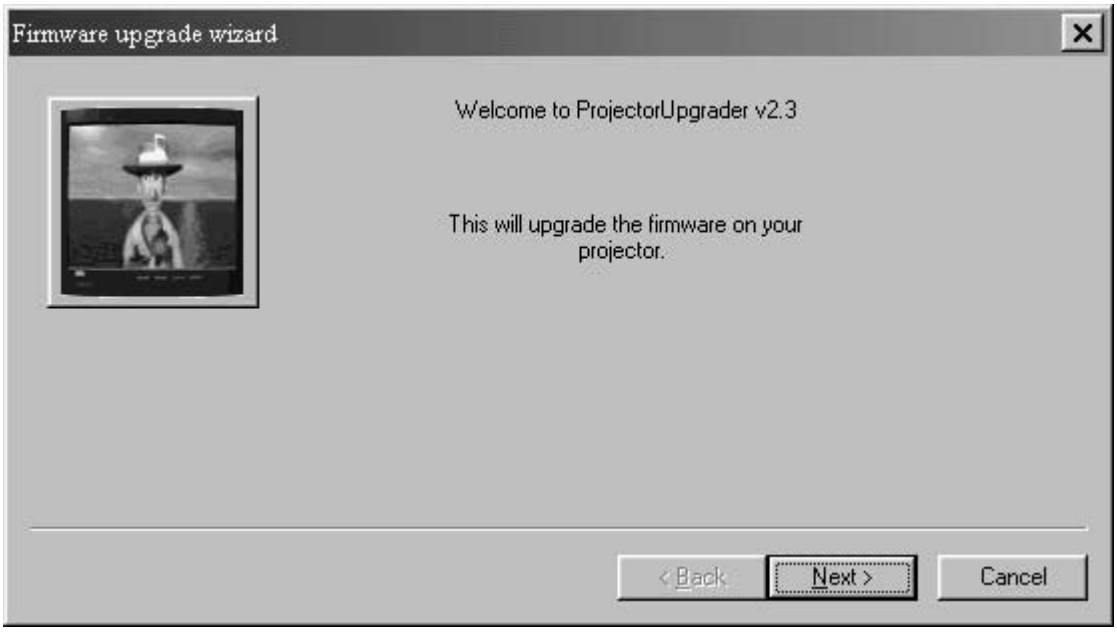
Now you're ready to upgrade the software.

Upgrade the software

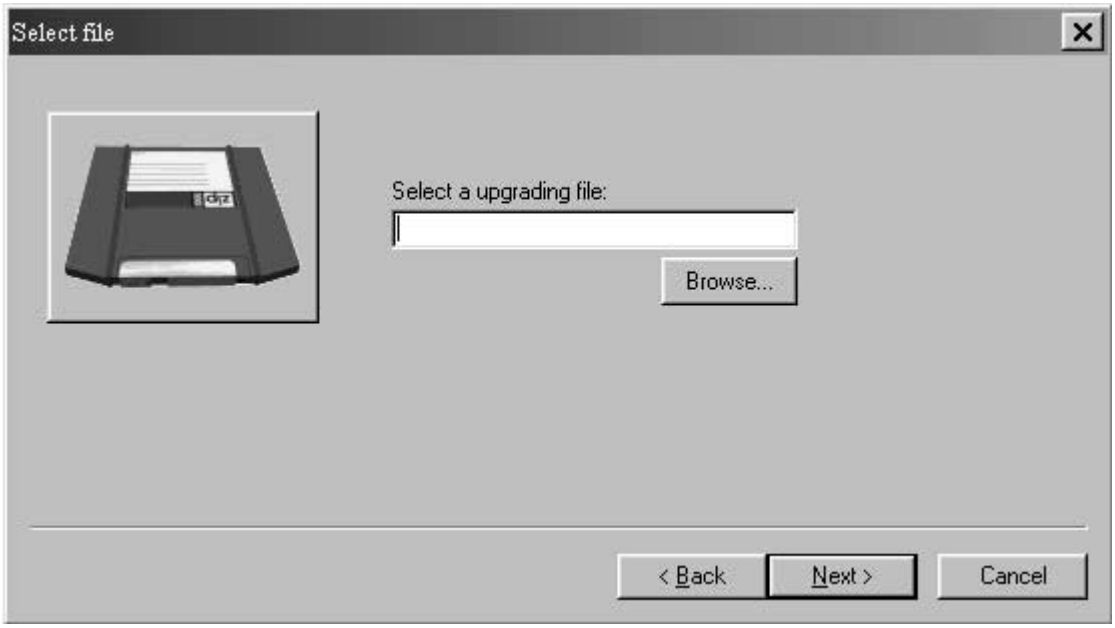
1 Open Windows Explorer, navigate to the location where you stored the upgrade files, then double-click the flashupgrade2_3 utility.



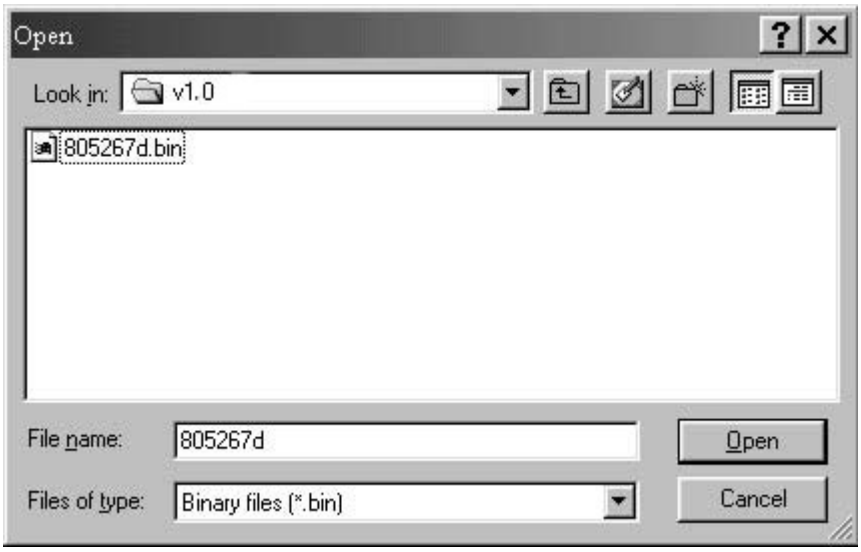
The Upgrade Wizard appears, ready to begin the upgrade process.



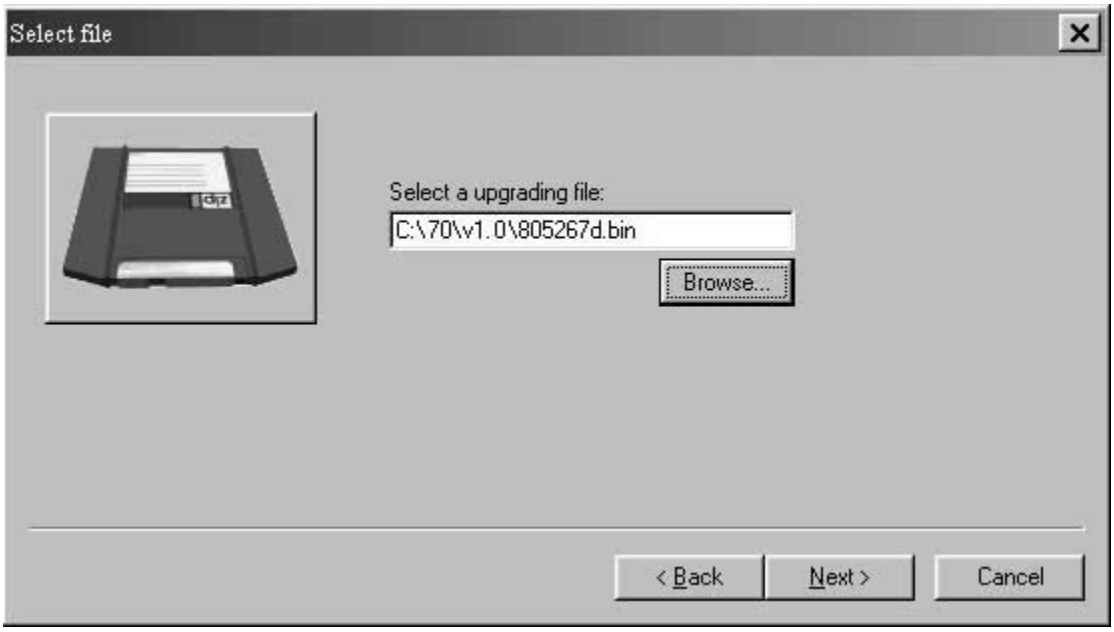
2 Click the Next button to open the Select File dialog box. Click Browse.



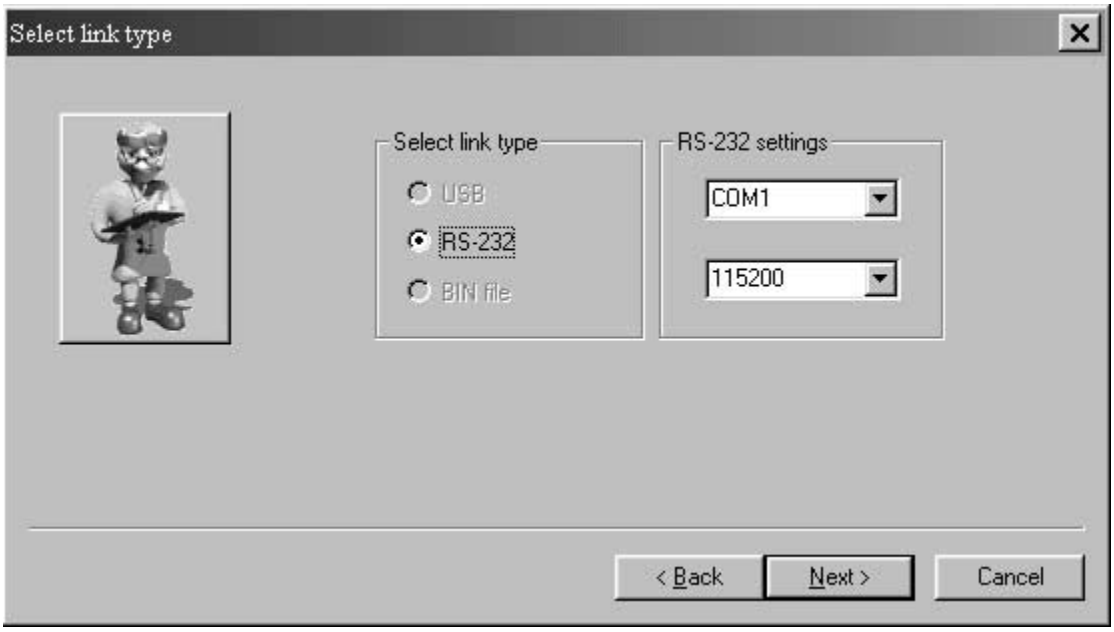
3 In the Open dialog box, select the **.bin** file, then click Open.



The upgrade file appears in the Select File box. Click the Next button.



4 In the Select Link Type dialog box, select the COM 1 or COM 2 port on your computer and set the Baud rate to 115200 bits/sec. Then click the Next button.



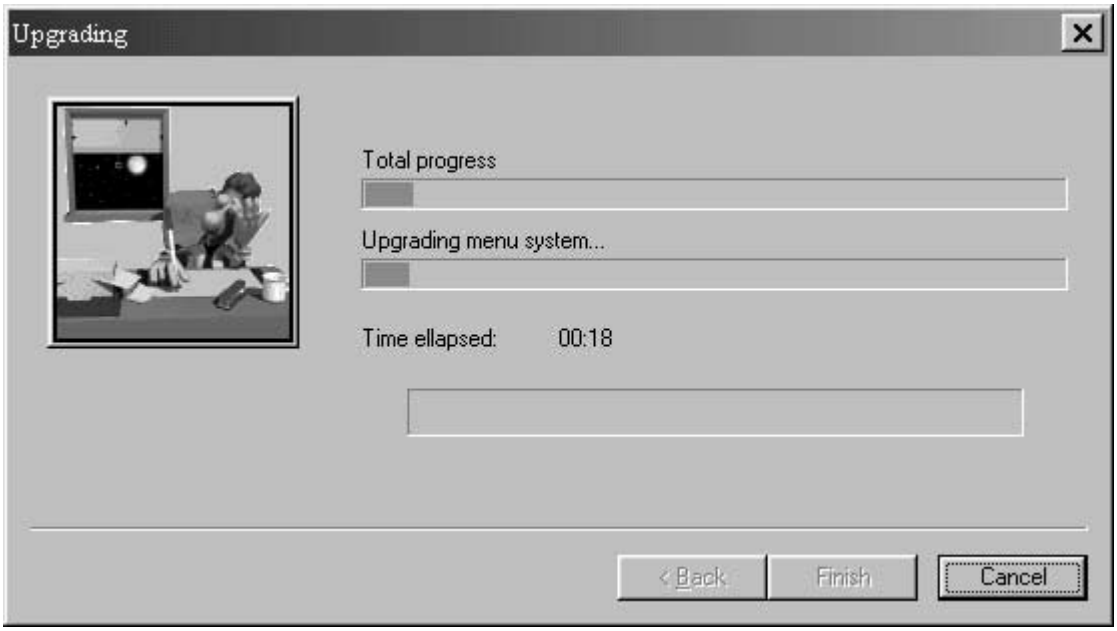
NOTE The Baud Rate must be 115200 bits/sec and the link type RS232. Otherwise the upgrade will not work.

5 Press and hold the up arrow key on the keypad, then plug in the power cord.

Immediately release and re-press the up arrow key (within 1 second) and the upgrade begins automatically. You do not need to power on the projector.

You may need to do this more than once to begin the upgrade. If the Upgrading dialog box does not show progress, unplug the projector and try again. If the upgrade fails after several tries, check the COM port setting and the cable connections.

The computer begins downloading the upgrade files to the projector. The process may take several minutes.



When the upgrade finishes, click the Finish button.

The upgrade is complete.

Confirm the software upgrade

1. Unplug the mouse cable from the projector, then power up the projector.
2. On the projector keypad, press the **Menu** key to display the menus.
3. Press the down arrow to highlight **Setup**, then press the **Select** key.
4. In the Setup menu, select **Service**.
5. In the Service menu, select **Info**.

   The Service Info dialog box displays the software build number (1.0 in this example) and the software version. These should match the build and upgrade filename you downloaded.

Functional Tests

You perform the functional tests after you've repaired the projector to make sure all components of the projector operate properly. You can also perform the functional tests if you're having trouble determining what is wrong with the projector. For additional help in diagnosing trouble with the projector, see *Troubleshooting* on page 56.

Required equipment

Equipment	Notes
Video player	Make sure the video player has an S-video Out port and cables. The player should also have a Composite video output port (RCA). **Toshiba strongly suggests you use a DVD player to test the video quality.** DVD players reproduce colors better and project sharper images. The least preferable is a VCR. If you must use a VCR, make sure you use a commercially produced recording, not one recorded from a broadcast source. The VCR must include an S-video connector in addition to a composite connector.
Commercially produced video	You'll need the video in DVD, laser disc, or videocassette format. A good resource is *Video Essentials, Optimizing Your Audio/Video System* (DVD International, 1997).
Audio & Video cables	Use the cables that come with the projector, including the Digital Video Interface (DVI) cable.
RGB test screens	Download and use the test patterns from your ASC Resource Center to check image quality.
PC multimedia presentation	For example, you can use a PowerPoint presentation with sound, photographs, graphics and .avi files.
Remote control	Ensure that the remote has fresh AA batteries.
Projection screen	Use a flat screen, not a curved one.
PC with digital video and sound card	Make sure the card has an M1 Digital Video Interface (DVI) output port. The stereo audio card should have either a 3.5mm stereo audio jack or RCA left and right output ports. The computer must have a CD-ROM and must have outputs for RGBHV, VESA, M1 Analog and M1 Digital.

Before beginning

Make sure the work surface where you perform the functional tests is level and clean. Place the projector on a soft surface (such as an anti-static mat) when running the tests.

Connect the following to the I/O panel on the projector:

- Video player through Composite Video and S-video ports
- Audio source through the 3.5mm mini-jack
- Computer through M1A cable

Perform the following tests

Test	Verification
Power Up Connect AC power, and turn the unit on.	Verify that the proper splash (logo) screen appears. Verify image quality.
Cosmetics and mechanicals Adjust the projector so that the image is square. Make sure the lens is at a 90° angle to the wall.	Verify that the elevator and leveling foot are functional. Verify that the focus and zoom rings operate properly. Verify cosmetics.
Composite video from video source Connect the yellow composite (RCA) video connector to the projector. (Ensure that no other video source is connected to the projector.)	Verify that the video automatically synchronizes. Verify there is no distortion, noise or other abnormalities.
S-Video from video source Connect the S-video cable to the projector. Disconnect the yellow composite (RCA) video connector.	Verify that the video automatically synchronizes. Verify there is no distortion, noise or other video abnormalities.
Image keystone adjustment Connect a video source to the projector. On the keypad, press the Keystone up (up arrow), then Keystone down (down arrow) keys.	Verify that the image responds properly when you adjust the keystone setting.
Audio from audio source Connect the audio cable to the projector. On the keypad, press the Volume up (right arrow), then the Volume down (left arrow) keys.	Verify that the audio source plays through the projector's speaker. Verify that the volume controls function correctly.
Manual source selection On the keypad, press the Source/Select key. Manually select a connected source.	Verify that the projector switches to the manually-selected source. Verify that the video automatically synchronizes. Verify there is no distortion, noise or other video abnormalities.
Software Version / Lamptime Used	Verify software version.

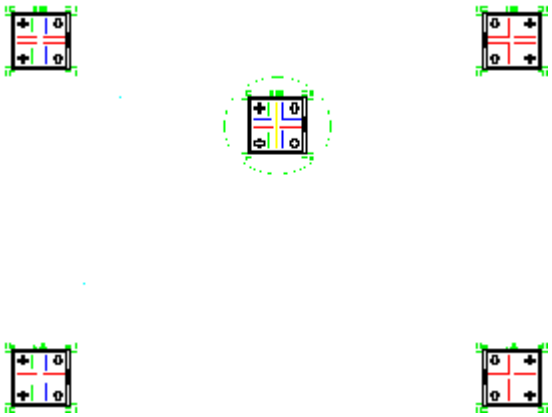
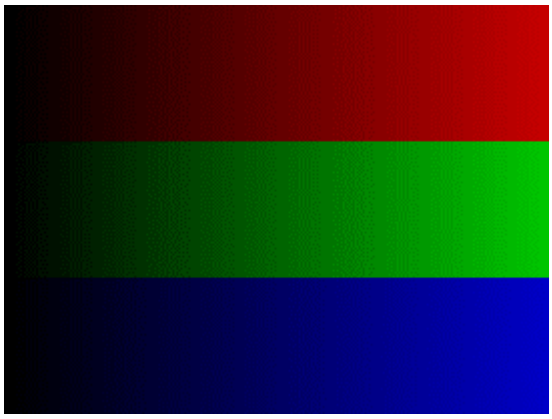
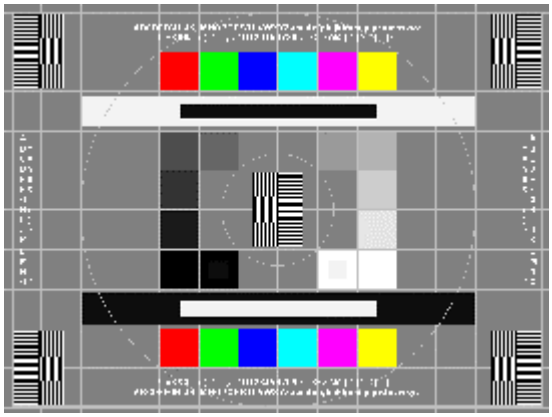
On the keypad, press the Menu key. Navigate through the Basic menu to the Setup menu. Navigate to the Service menu. Select Info from the Service menu.	Verify the keys are not sticky. Verify that the software version is current and that the lamp is within its service life.
The next step is to observe 3 computer images. These will confirm that the computer input works properly, and will test image quality.	Verify that the image synchronizes properly through the M1 input.
Image #1: Focus Test Image Turn off any local light. Turn the **zoom ring** to make the smallest image. Focus the image so the middle icon is clearly focused. Focus the image on the 4 green squares. After focusing on the green squares on the middle icon, turn the **zoom ring** to make the largest image, then repeat the focus tests.	 Verify that all four corner icons have clear resolution. Verify that the white space is visible on all 5 bar/line icon areas (between green). Verify that the image focuses through the full zoom range.
Image #2: Color Ramp Project the Color Ramp image.	 Verify there are no missing parts of the ramp. Verify that the bars are not flashing. Verify that the transitions from light to dark are smooth and gradual.

Image #3: SMPTE133 Project the SMPTE133 image.	 Verify that there are no noise, tint, duplicating columns, or other general image abnormalities present.
System Reset On the keypad, press the **Menu** key. Navigate through the **Basic** menu to the Reset function. Select **Reset**.	Verify that the image synchronizes after system reset.
Power Down After all tests are complete turn the power off and disconnect all cables. Attach the lens cap.	Verify unit is powered off before disconnecting cables.

Troubleshooting

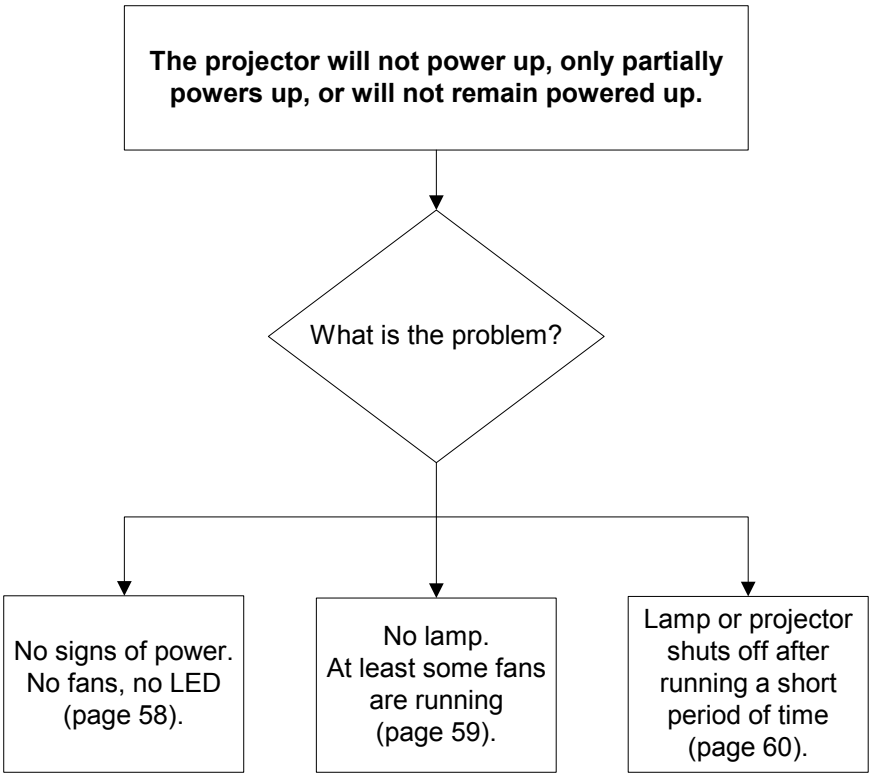
You use this section to diagnose problems with the projector. Choose the problem you are trying to diagnose from the list below. The Power, Image and Audio sections provide a variety of symptoms, while the others include only one page.

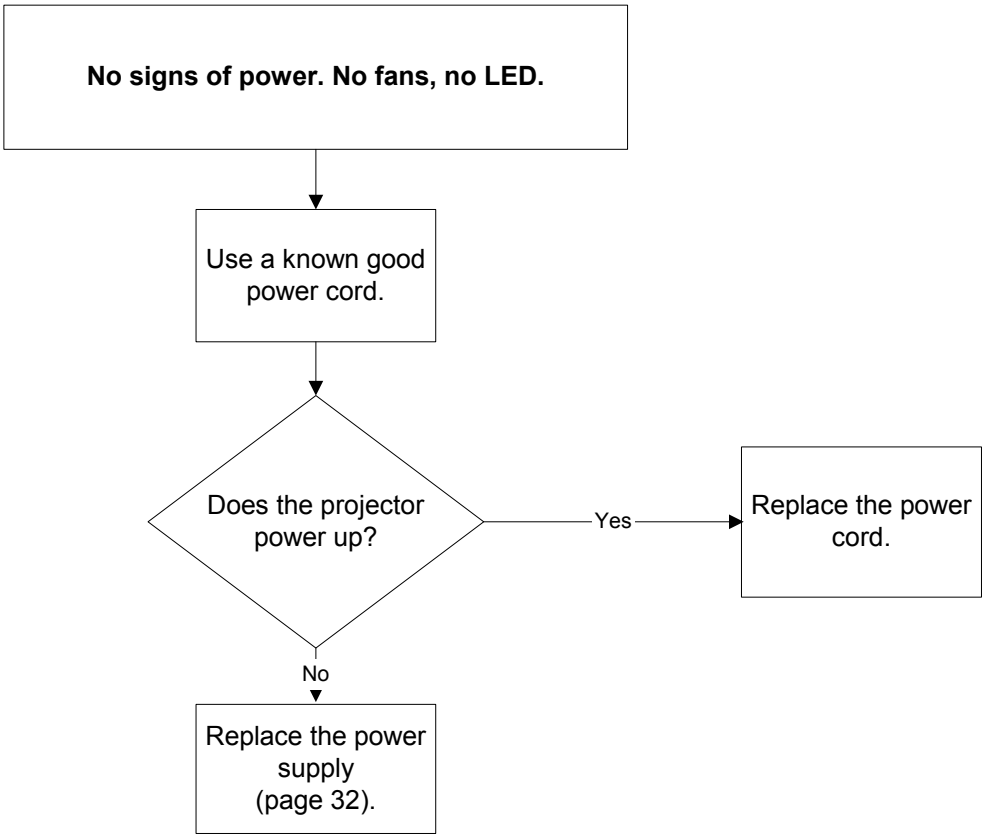
- For Power problems, see page 57.
- For Image problems, see page 61.
- For Audio problems, see page 65.
- For Remote Control problems, see page 68.
- For Keypad problems, see page 69.
- For Menu problems, see page 70.

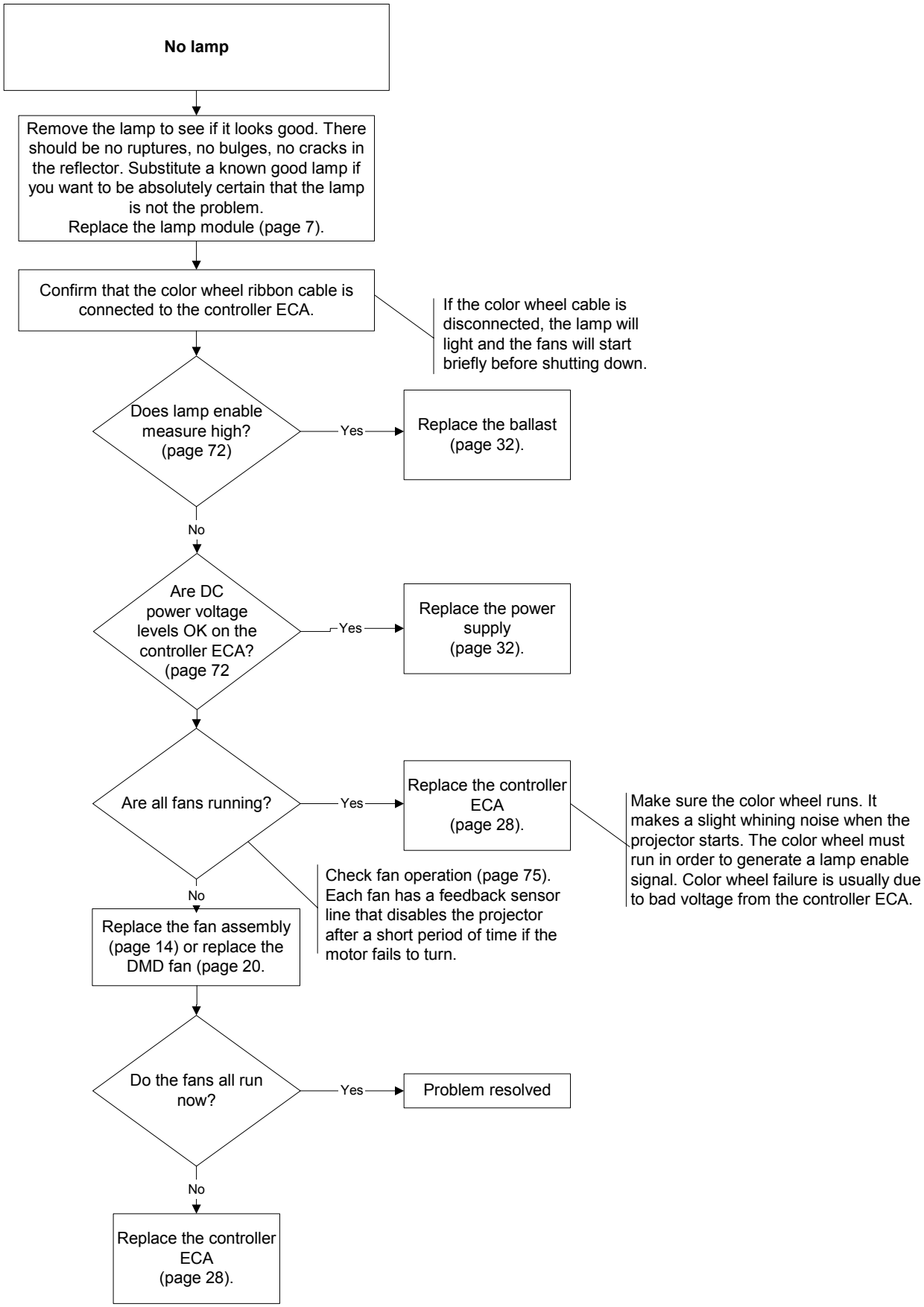
In addition to the troubleshooting trees, you will also find the following items:

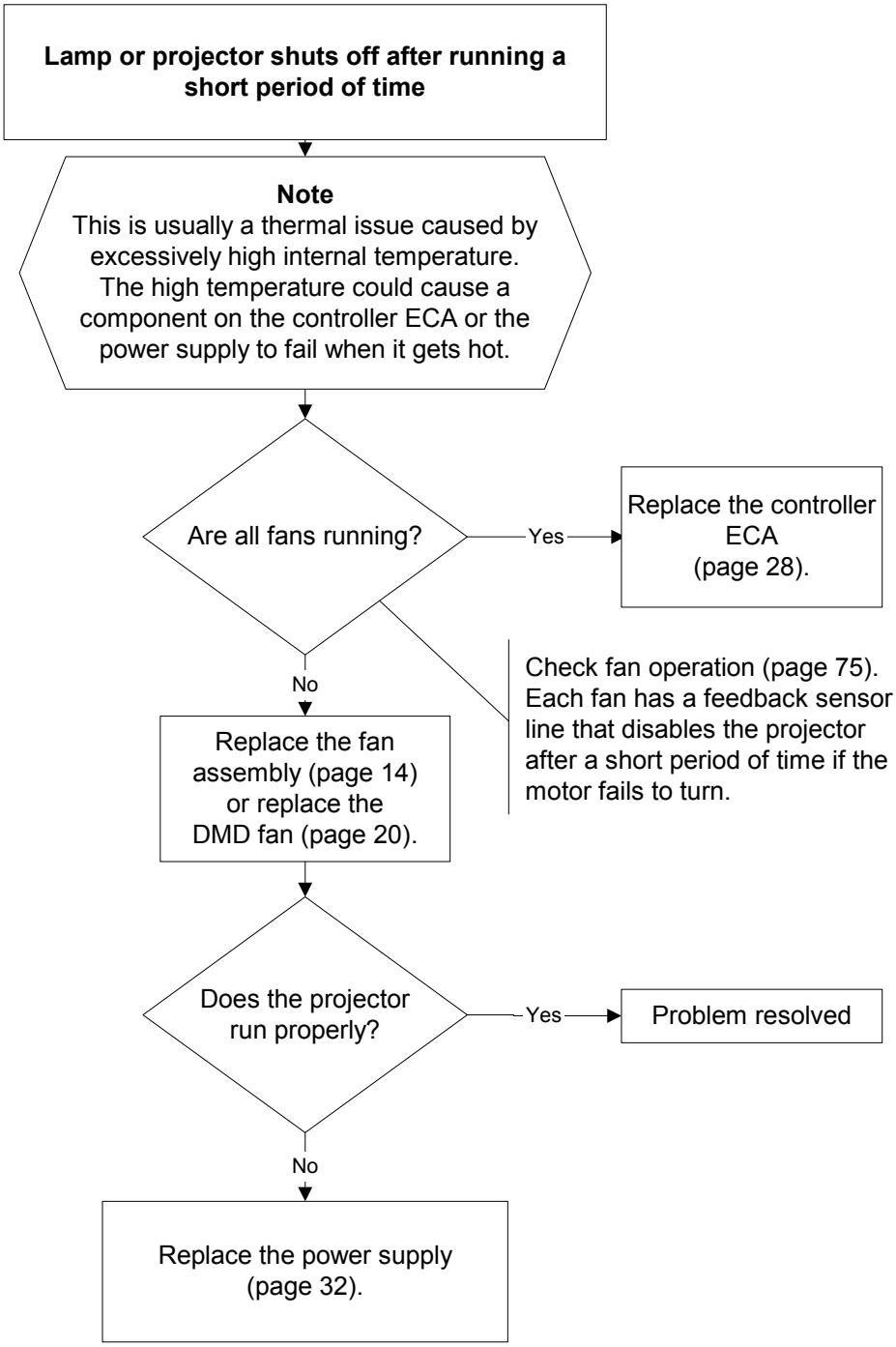
- Wiring diagram on page 71.
- Controller voltage check points on page 72.
- Check controller voltages at connectors on page 73
- Ballast voltage check point on page 74.
- Check fan operation on page 75.
- Check speaker resistance on page 77.

Troubleshooting Power Problems

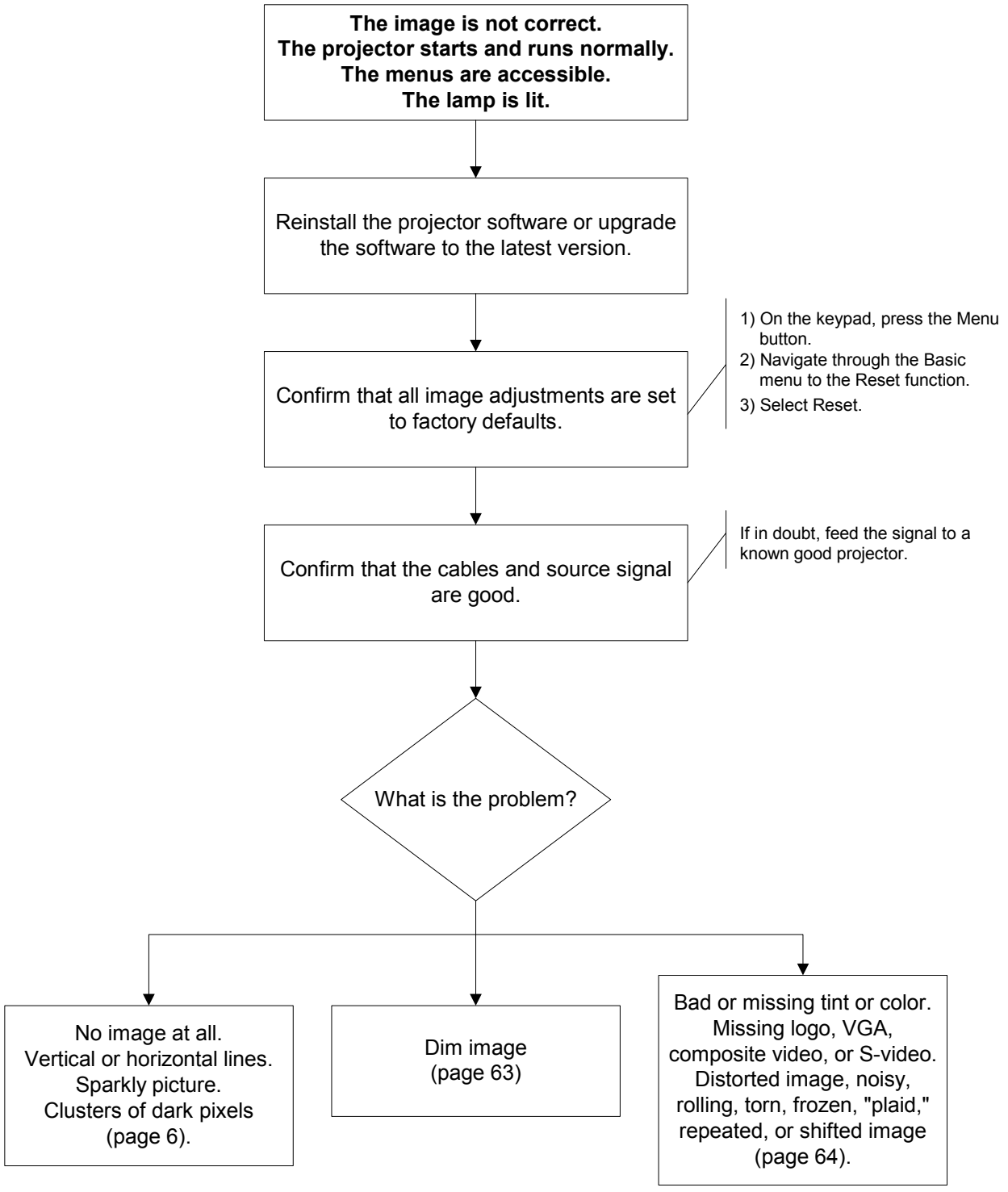


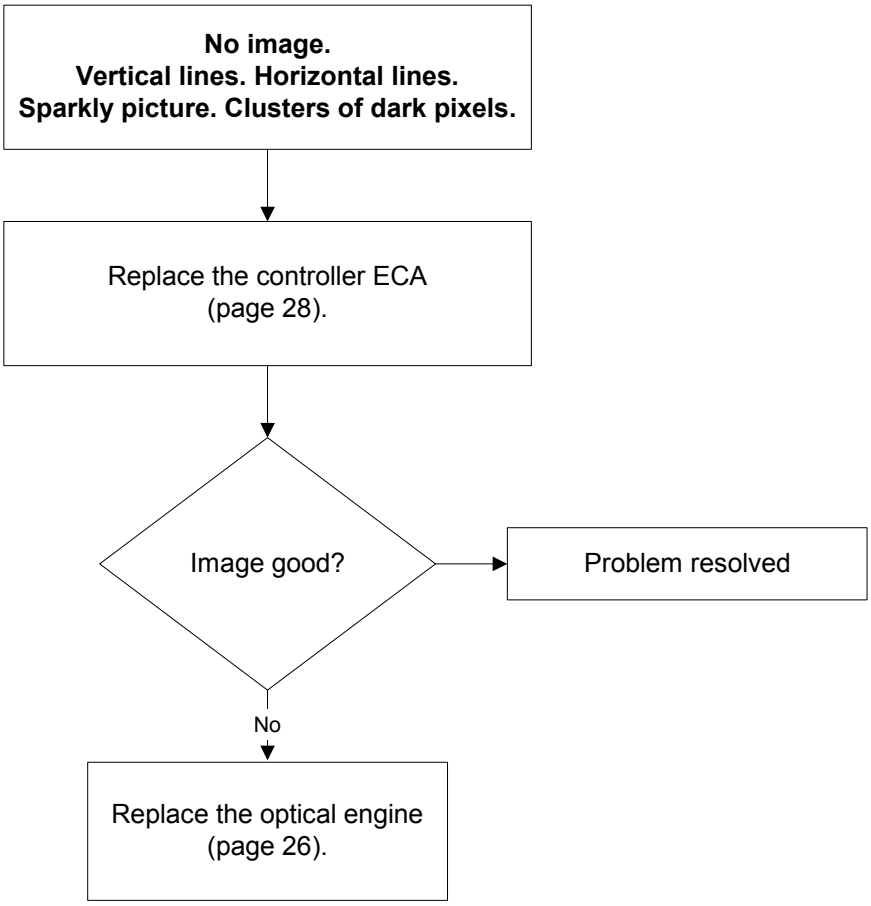

No signs of power. No fans, no LED.
Use a known good power cord.
Does the projector power up?
Yes
Replace the power cord.
No
Replace the power supply (page 32).

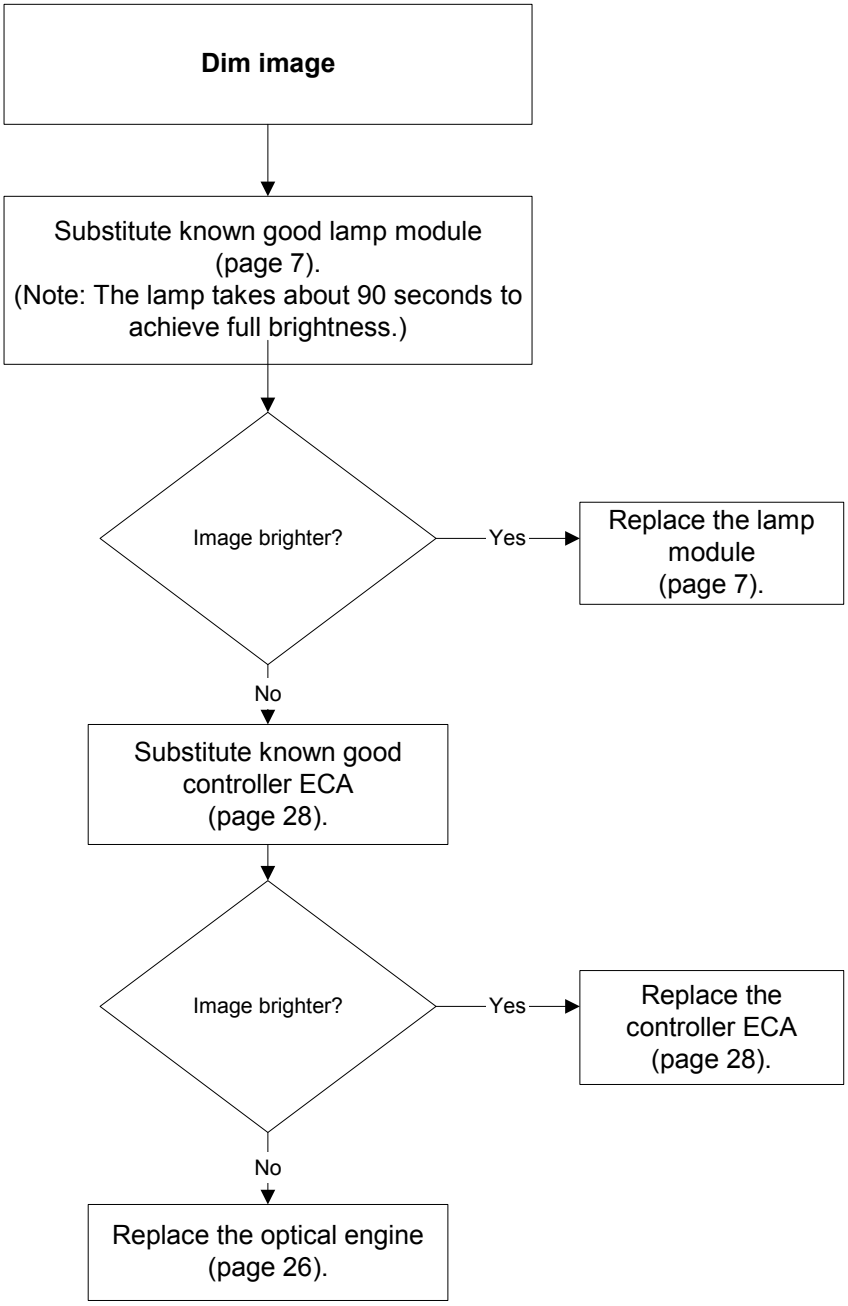

No lamp
Remove the lamp to see if it looks good. There should be no ruptures, no bulges, no cracks in the reflector. Substitute a known good lamp if you want to be absolutely certain that the lamp is not the problem.
Replace the lamp module (page 7).
Confirm that the color wheel ribbon cable is connected to the controller ECA.
If the color wheel cable is disconnected, the lamp will light and the fans will start briefly before shutting down.
Does lamp enable measure high? (page 72)
Yes
Replace the ballast (page 32).
No
Are DC power voltage levels OK on the controller ECA? (page 72
Yes
Replace the power supply (page 32).
Are all fans running?
Yes
Replace the controller ECA (page 28).
Make sure the color wheel runs. It makes a slight whining noise when the projector starts. The color wheel must run in order to generate a lamp enable signal. Color wheel failure is usually due to bad voltage from the controller ECA.
Check fan operation (page 75). Each fan has a feedback sensor line that disables the projector after a short period of time if the motor fails to turn.
No
Replace the fan assembly (page 14) or replace the DMD fan (page 20.
Do the fans all run now?
Yes
Problem resolved
No
Replace the controller ECA (page 28).

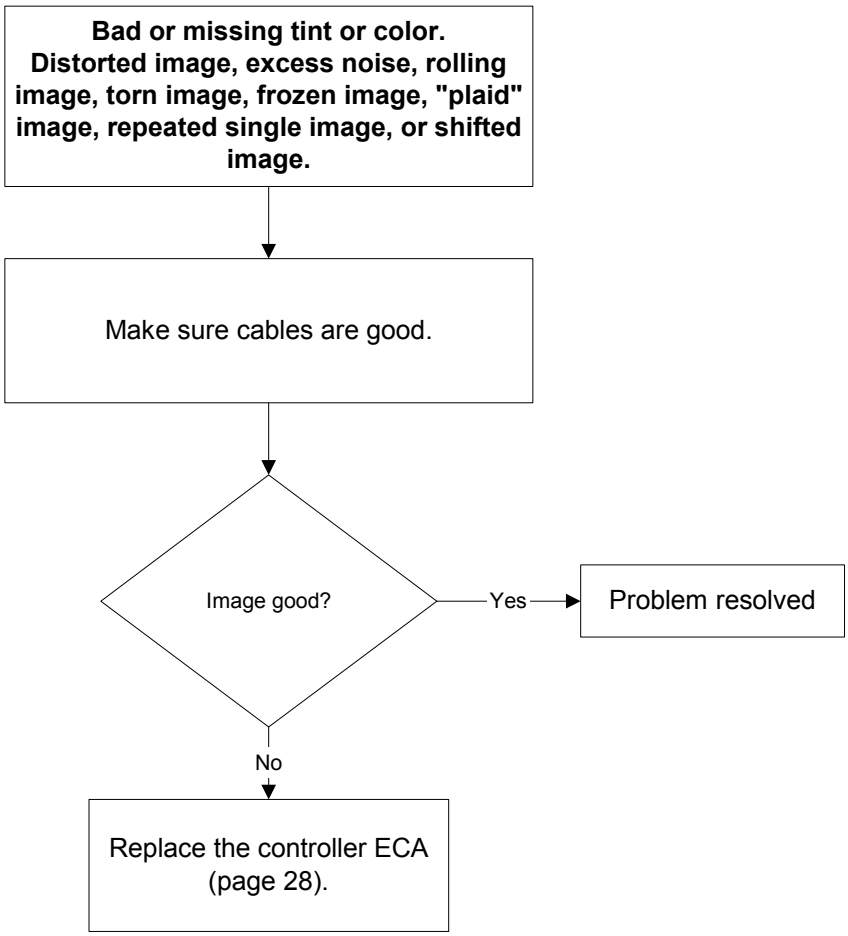

Lamp or projector shuts off after running a short period of time
Note
This is usually a thermal issue caused by excessively high internal temperature. The high temperature could cause a component on the controller ECA or the power supply to fail when it gets hot.
Are all fans running?
Yes
Replace the controller ECA (page 28).
No
Check fan operation (page 75). Each fan has a feedback sensor line that disables the projector after a short period of time if the motor fails to turn.
Replace the fan assembly (page 14) or replace the DMD fan (page 20).
Does the projector run properly?
Yes
Problem resolved
No
Replace the power supply (page 32).

Troubleshooting Image Problems

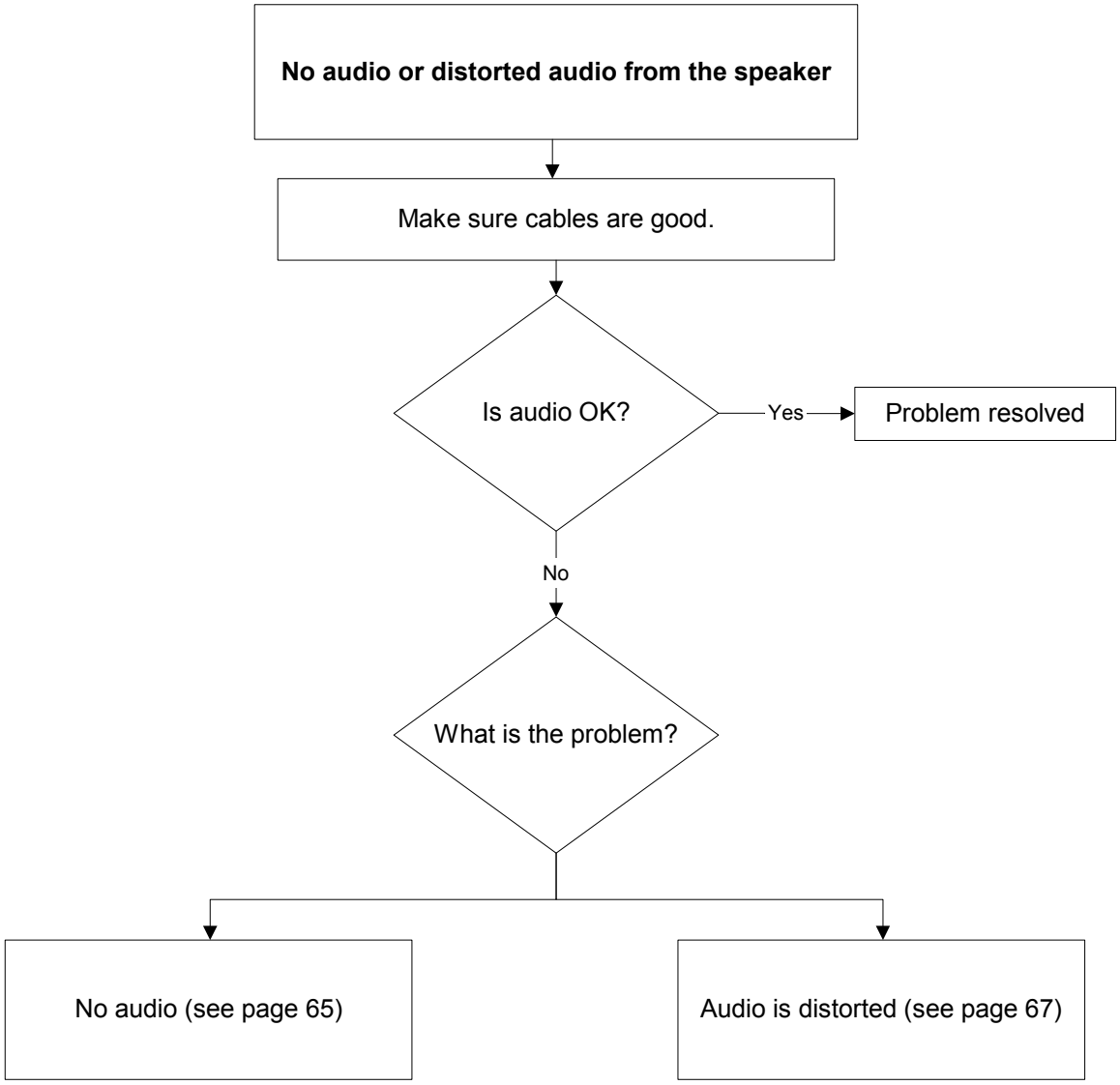


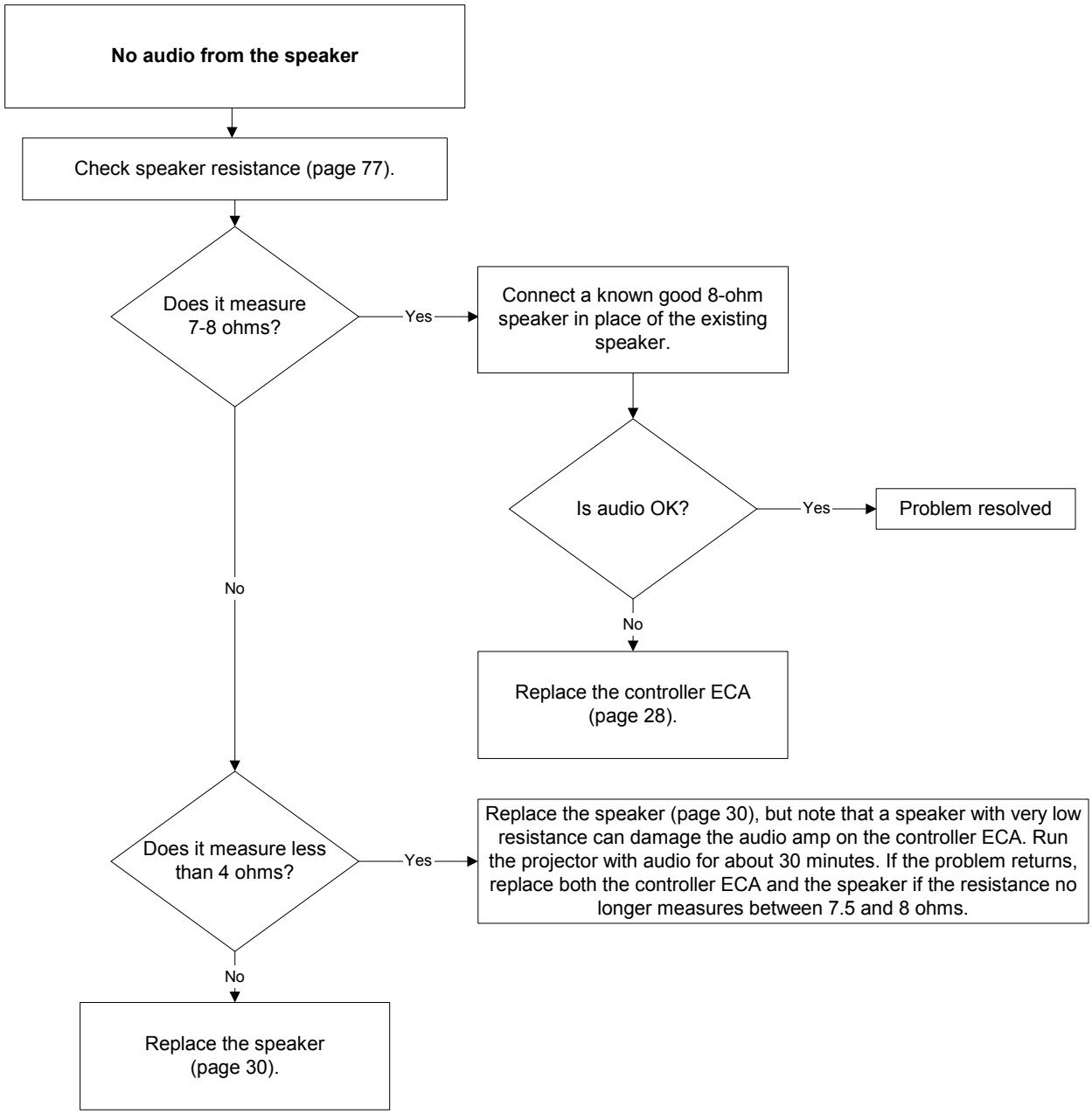

No image.
Vertical lines. Horizontal lines.
Sparkly picture. Clusters of dark pixels.
Replace the controller ECA
(page 28).
Image good?
Problem resolved
No
Replace the optical engine
(page 26).

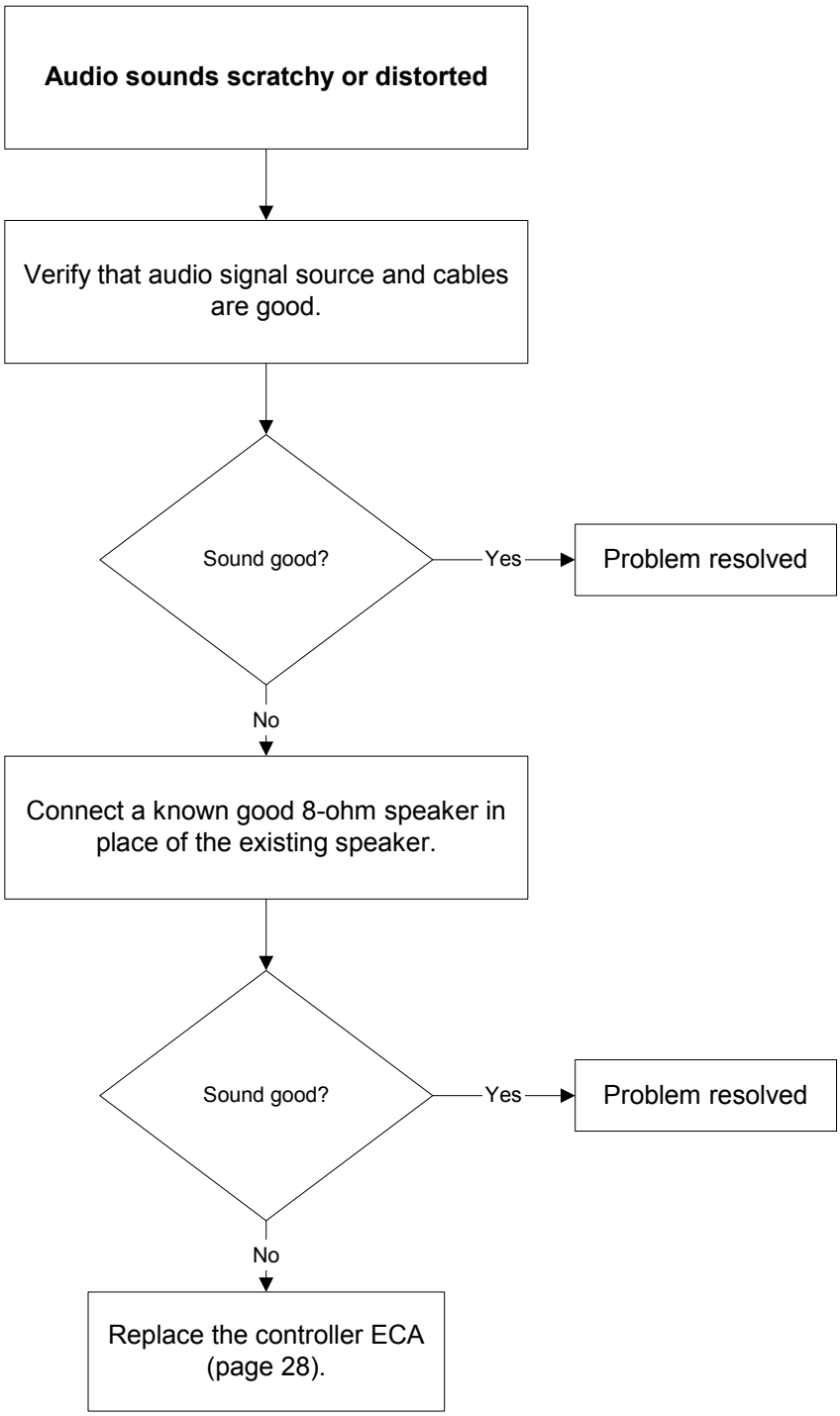

Dim image
Substitute known good lamp module (page 7).
(Note: The lamp takes about 90 seconds to achieve full brightness.)
Image brighter?
Yes
Replace the lamp module (page 7).
No
Substitute known good controller ECA (page 28).
Image brighter?
Yes
Replace the controller ECA (page 28).
No
Replace the optical engine (page 26).


Bad or missing tint or color. Distorted image, excess noise, rolling image, torn image, frozen image, "plaid" image, repeated single image, or shifted image.
Make sure cables are good.
Image good?
Yes
Problem resolved
No
Replace the controller ECA (page 28).

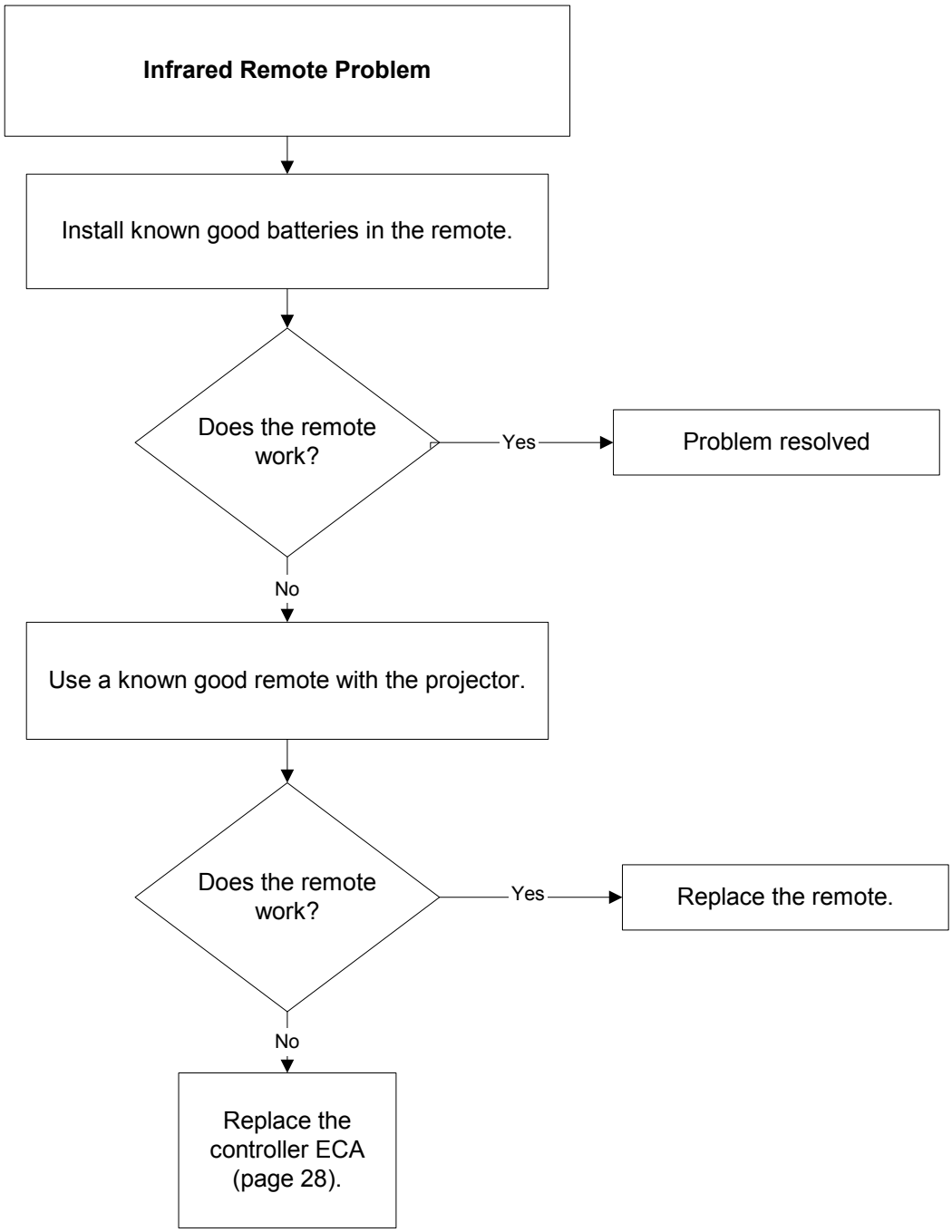
Troubleshooting Audio Problems



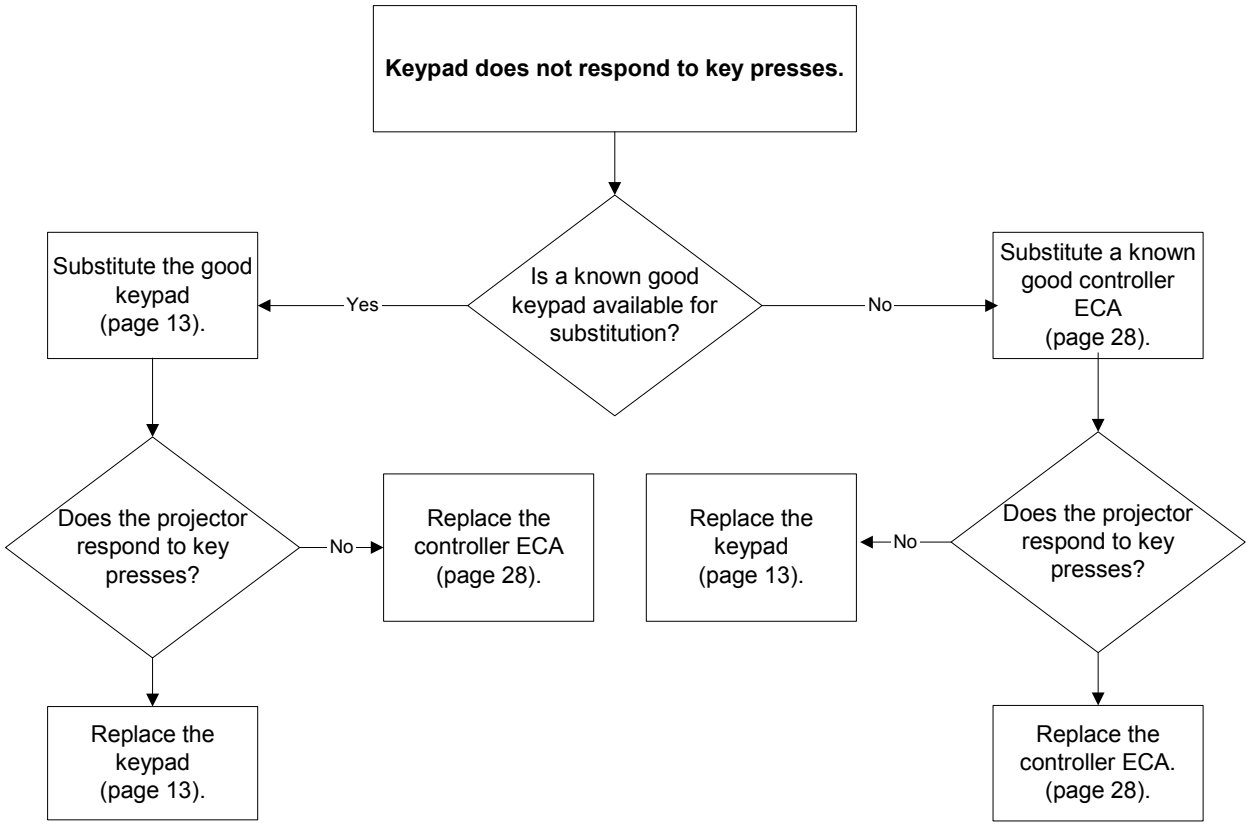

No audio from the speaker
Check speaker resistance (page 77).
Does it measure 7-8 ohms?
Yes
Connect a known good 8-ohm speaker in place of the existing speaker.
Is audio OK?
Yes
Problem resolved
No
Replace the controller ECA (page 28).
No
Does it measure less than 4 ohms?
Yes
Replace the speaker (page 30), but note that a speaker with very low resistance can damage the audio amp on the controller ECA. Run the projector with audio for about 30 minutes. If the problem returns, replace both the controller ECA and the speaker if the resistance no longer measures between 7.5 and 8 ohms.
No
Replace the speaker (page 30).


Audio sounds scratchy or distorted
Verify that audio signal source and cables are good.
Sound good?
Yes
Problem resolved
No
Connect a known good 8-ohm speaker in place of the existing speaker.
Sound good?
Yes
Problem resolved
No
Replace the controller ECA (page 28).

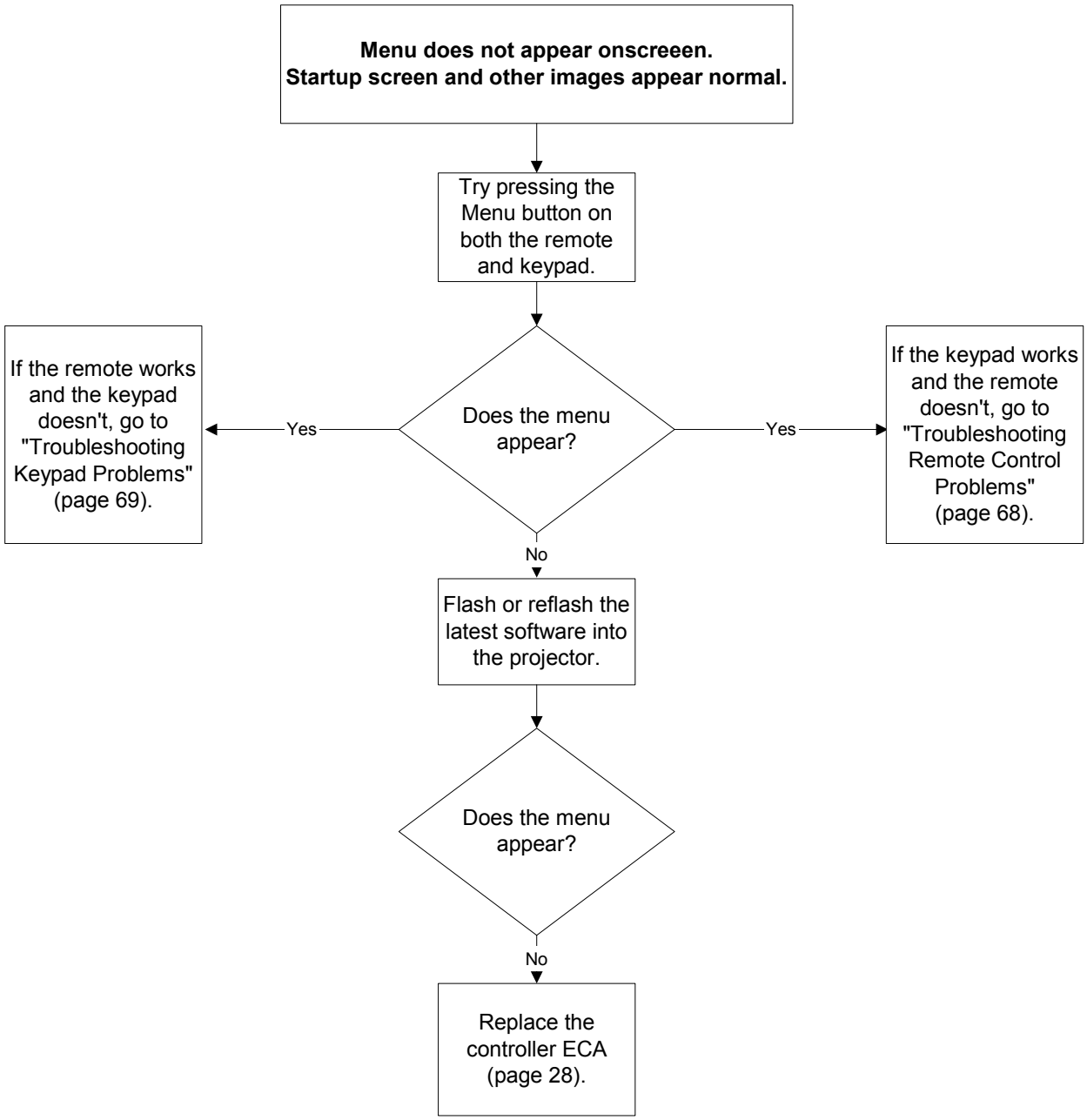
Troubleshooting Remote Control Problems



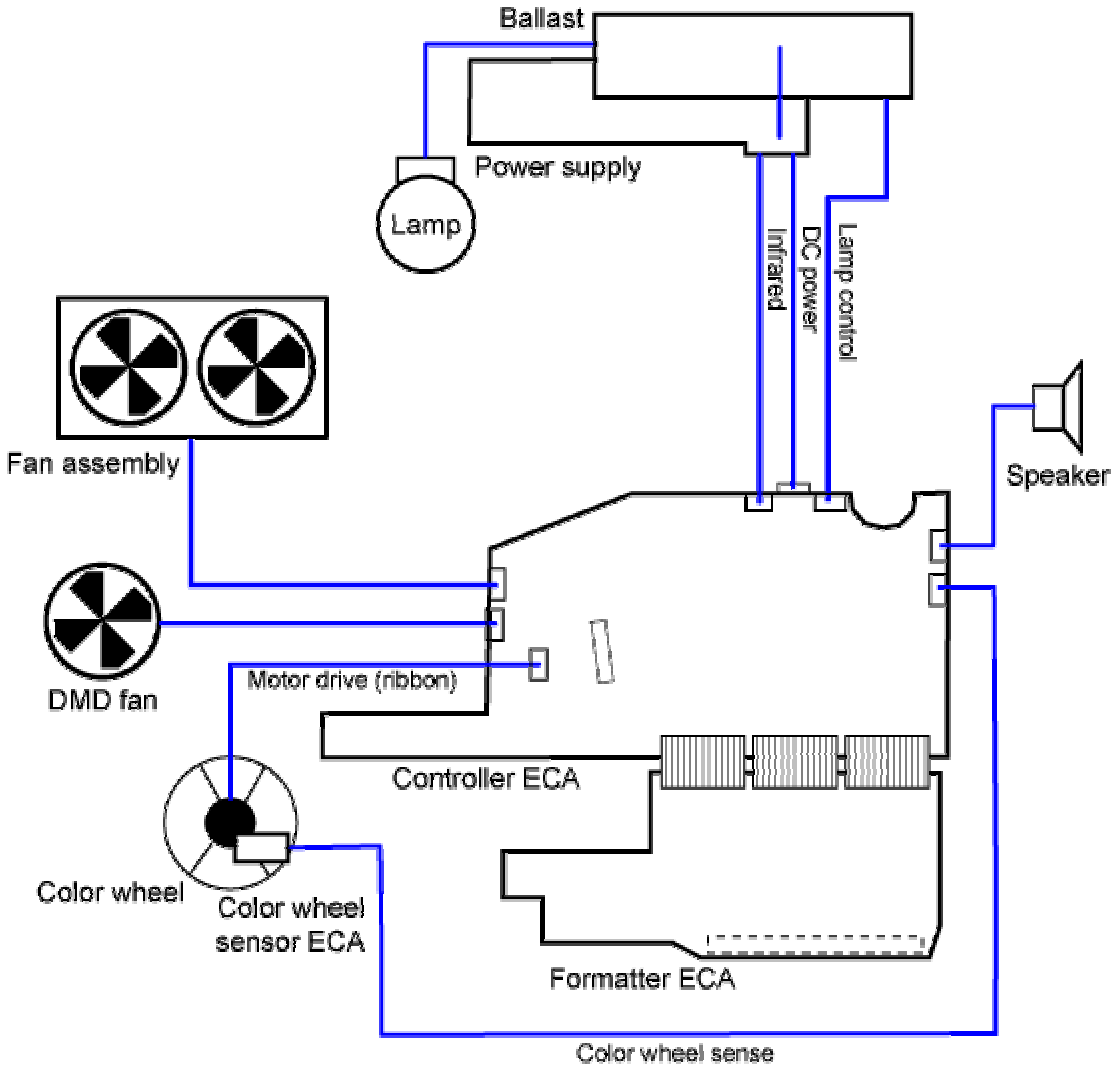
Troubleshooting Keypad Problems



Troubleshooting Menu Problems



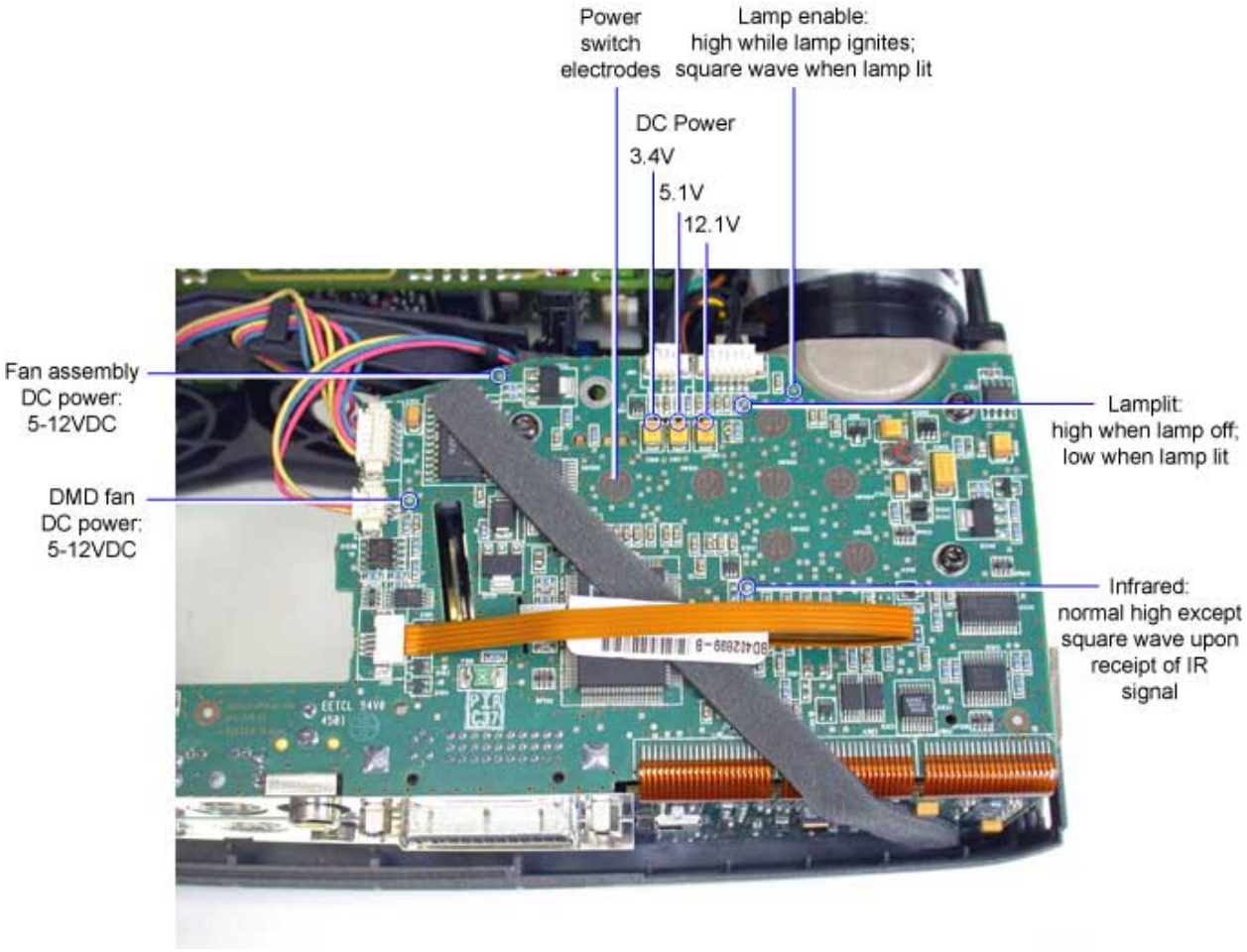
Wiring Diagram



Controller voltages

To check voltages, you need to remove the top case (see page 9). Leave the lamp module installed in the projector. Then use the remote control or briefly short the power switch electrodes to power up the projector.

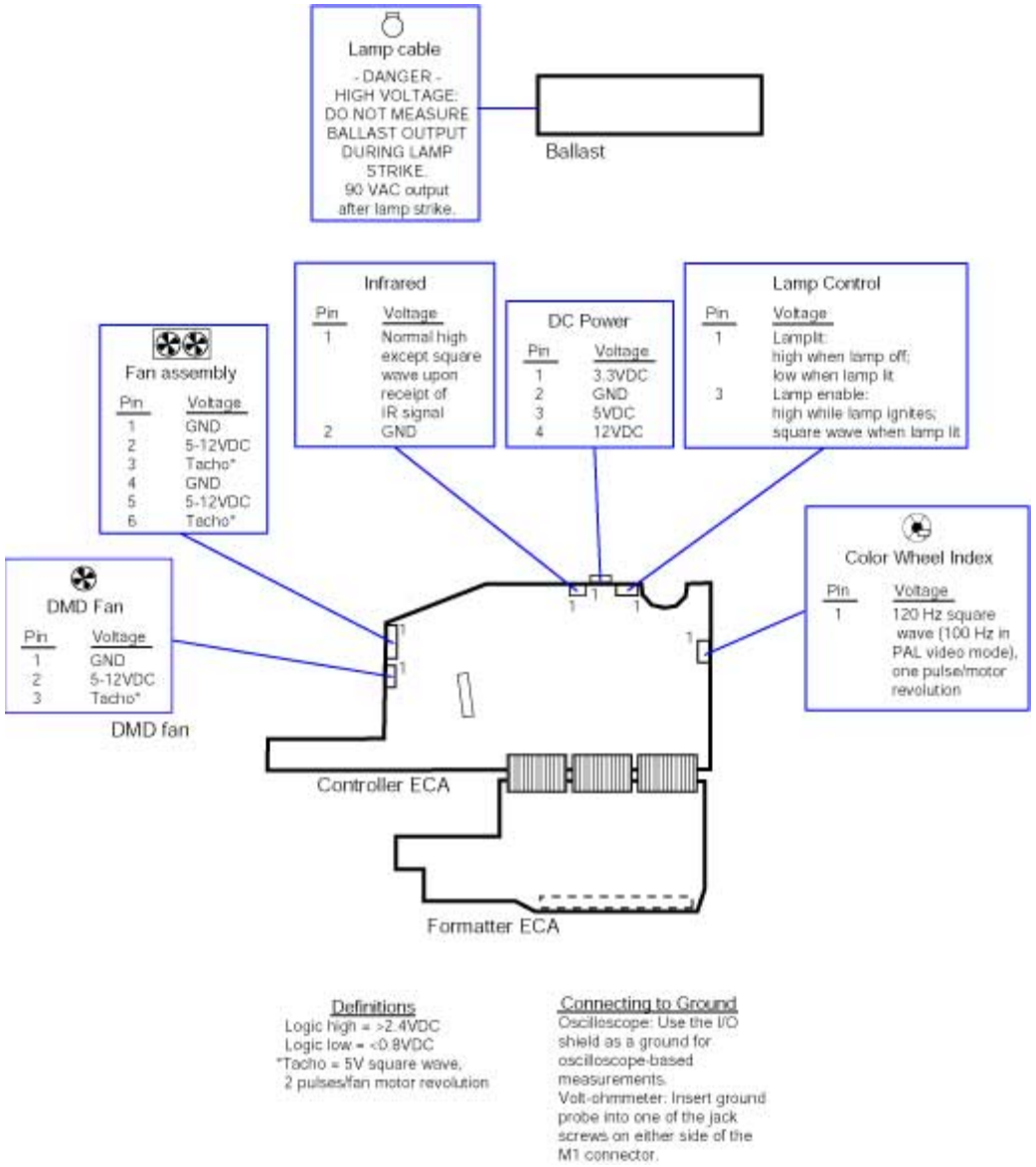
You can also check voltages at connectors on the controller ECA (see the following page).



Check Controller Voltages at Connectors

To check voltages, you need to remove the top case (see page 9). Leave the lamp module installed in the projector. Then use the remote control or briefly short the power switch electrodes to power up the projector.

The figure below shows connectors on the controller ECA that you can check to determine its operational state. You can also check voltages at points on the controller ECA (see the previous page).

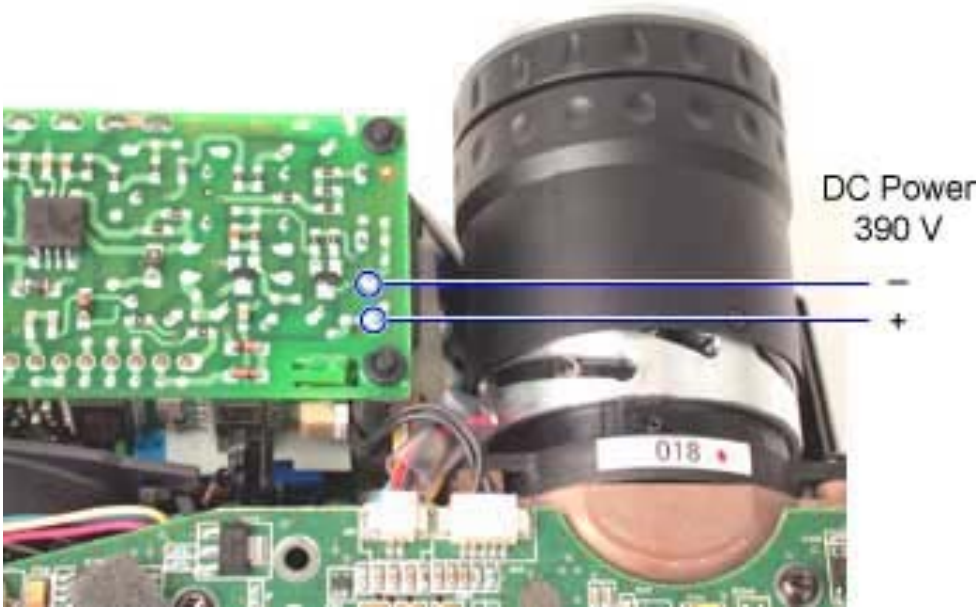


Ballast Voltage Check Points

To check the ballast input voltage, you need to remove the top case (see page 9). Leave the lamp module installed in the projector. Then use the remote control or briefly short the power switch electrodes to power up the projector.

Check to see if the ballast is receiving DC power from the power supply.

You can also check voltages on the controller ECA (see page 72) to see if it is receiving DC power from the power supply.



Check Fan Operation

This procedure allows a visual check of fan operation. You can use this procedure to check the operation of the fan assembly and the DMD fan.

You can also check the voltage at connectors on the controller ECA to determine the operational state of either fan.

Checking the Fan Assembly

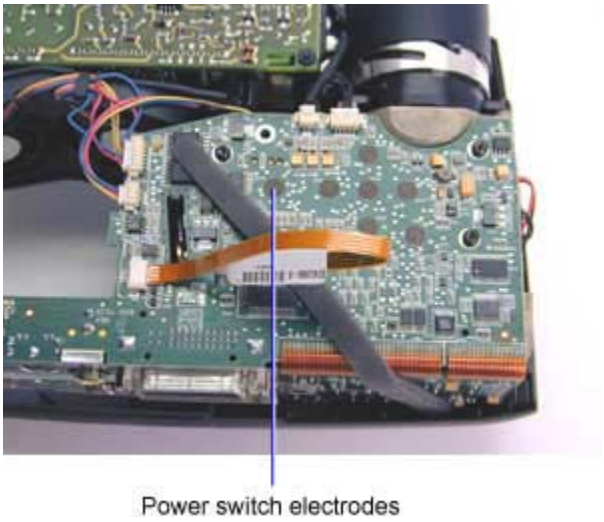
To check operation of the fan assembly, do the following:

1. Remove the lamp module (page 7).
2. Examine the fan assembly through the recess in the bottom case. Plug the projector in and turn it on. Both fans in the fan assembly should start up and run for 5 - 10 seconds, then shut down (because there is no lamp installed). This is time enough to make sure the fans work properly.

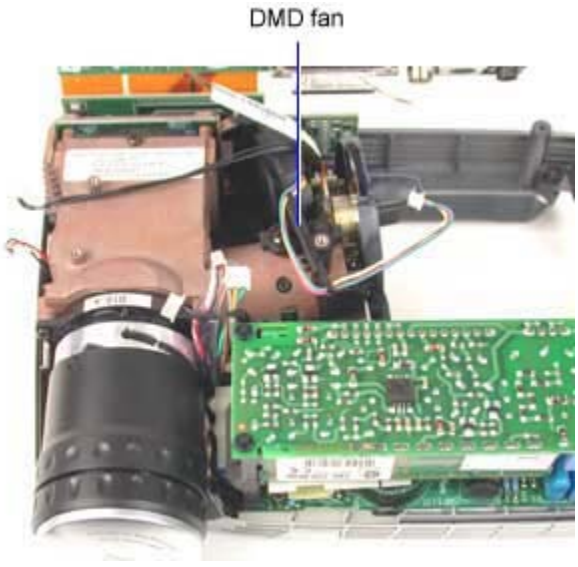
Checking the DMD Fan

To check operation of the DMD fan, do the following:

1. Remove the lamp module (page 7).
2. Remove the top case (page 9).
3. Follow the procedure to partially remove the controller ECA (page 16), but only remove the screws. Disregard the instructions to unplug the cables.
4. Plug the projector in. Then use the remote control or briefly short the power switch electrodes on the controller ECA to start the projector.



5. Lift the controller ECA carefully and use a penlight to examine the DMD fan. The fan should start up and run for 5 - 10 seconds, then shut down (because there is no lamp installed). This is time enough to make sure the fan works properly.



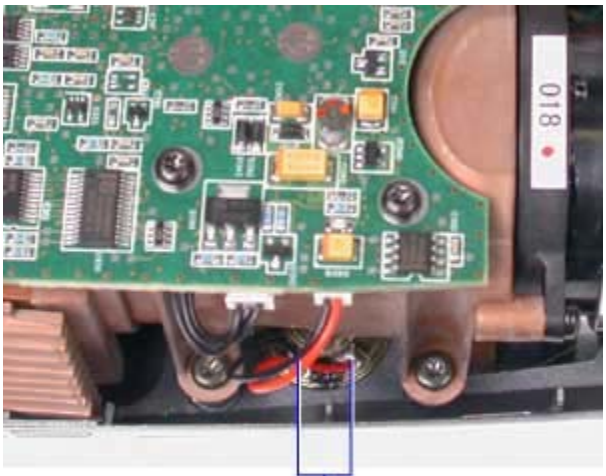
Check Speaker Resistance

This procedure allows you to check the speaker in the projector to see if the voice coil is functional. If the projector lacks audio output through the speaker, you can use this procedure to determine whether the speaker is bad or if an audio problem exists in the amplifier on the controller ECA.

Checking the Speaker

1. Remove the top case (page 9).
2. Locate the speaker terminals on the back of the speaker in the bottom case.

3. Use an ohmmeter to check the resistance between the terminals. A measurement between 7 and 8 ohms indicates a good speaker. If you read more or less resistance, the speaker is damaged.



Resistance between speaker terminals should measure between 7 and 8 ohms

Parts Lists

Exploded View

FRUs by alphabetic listing

Below is an alphabetically arranged list of FRUs used in the projector. Beneath the name for each part or assembly is the official part name as it's entered in the Bill of Materials (BOM) database. The second name is for reference only. It may help clarify questions about shipping.

Part Name	Part Number	Notes
Ballast (Power lamp)	300125x	
Bottom case (Assy., bottom, D3)	505-1260-xx	Requires certification label, #020-1475-xx, model label, #020-1477-xx and power rating label, #020-1487-xx.
Cable, color wheel sensor **(Cable, color wheel sensor)**	211-0184-xx	
Cable, lamp (Cable, ballast-lamp, D3)	211-0181-xx	
Cable, lamp control	211-0170-xx	
Color wheel	525-0037-xx	Includes glass color wheel and drive motor.
Color wheel sensor ECA (PCBA D3 color wheel board)	308236x	
Controller ECA (Controller board D3)	410443	Includes foam airflow gasket (attached)
Elevator actuator (S/A, foot, mech)	505-1085-xx	
Elevator actuator spring (Spring footmech)	405913	
Elevator foot (Foot)	340-0924-xx	
Elevator spring (Spring foot)	405912	
Fan assembly (S/A, fan 50x10)	505-1027-xx	
Fan, DMD (S/A fan 45x10)	505-1028-xx	
Hardware kit (Mounting details D3)	410442	The hardware kit contains miscellaneous projector parts. See page 83 for a list of kit contents.

Part Name	Part Number	Notes
Keypad (S/A, keypad, D3)	505-1338-xx	
Label, certification (Label, bottom, cert)	020-1475-xx	Required for a new bottom case. For model TDP-P5-US only.
Label, certification (Label, bottom, cert)	020-1607-xx	Required for a new bottom case. For model TDP-P5-J only.
Label, model (Label, bottom, model)	020-1606-xx	Required for a new bottom case. For model TDP-P5-US only.
Label, model (Label, bottom, model)	020-1477-xx	Required for a new bottom case. For model TDP-P5-J only.
Label, I/O panel (Label, top, I/O)	020-1486-xx	Required for a new top case.
Label, power rating (Label, bottom, power)	020-1487-xx	Required for a new bottom case.
Leveling foot (Screw, leveling foot)	321-0183-xx	
Leveling foot retainer (Star lock leveling foot)	321-0184-xx	
Optical engine (Engine, optical, zoom, SGA, .7" DDR)	530-0388-xx	Includes projection lens, color wheel and color wheel sensor ECA
Power supply (Power PFE/DC)	300165x	
Rear bezel screen (Grid, protection outlet, D3)	330-0866-xx	
Speaker (S/A speaker, D3)	526-0116-xx	
Top case (Housing, Top, D3)	505-1259-xx	Requires I/O panel label, #020-1486-xx.

FRUs by numeric listing

Below is a numerically arranged list of FRUs used in the projector. You can also view FRUs by alphabetic listing on page 79.

Part Name	Part Number	Notes
Elevator spring (Spring foot)	405912	
Elevator button spring (Spring footmech)	405913	
Hardware kit (Mounting details D3)	410442	The hardware kit contains miscellaneous projector parts. See page 83 for a list of kit contents.
Controller ECA (Controller board D3)	410443	Includes attached foam airflow gasket
Label, certification (Label, bottom, cert)	020-1475-xx	Required for a new bottom case. For model TDP-P5-US only.
Label, model (Label, bottom, model)	020-1477-xx	Required for a new bottom case. For model TDP-P5-J only.
Label, I/O panel (Label, top, I/O)	020-1486-xx	Required for a new top case.
Label, power rating (Label, bottom, power)	020-1487-xx	Required for a new bottom case.
Label, certification (Label, bottom, cert)	020-1607-xx	Required for a new bottom case. For model TDP-P5-J only.
Label, model (Label, bottom, model)	020-1606-xx	Required for a new bottom case. For model TDP-P5-US only.
Cable, lamp control	211-0170-xx	
Cable, lamp (Cable, ballast-lamp, D3)	211-0181-xx	
Cable, color wheel sensor	211-0184-xx	
Ballast (Power lamp)	300125x	
Power supply (Power PFE/DC)	300165x	
Color wheel sensor ECA (PCBA D3 color wheel board)	308236x	

Part Name	Part Number	Notes
Leveling foot (Screw, leveling foot)	321-0183-xx	
Leveling foot retainer (Star lock leveling foot)	321-0184-xx	
Rear bezel screen (Grid, protection outlet, D3)	330-0866-xx	
Elevator foot (Foot)	340-0924-xx	
Fan assembly (S/A, fan 50x10)	505-1027-xx	
Fan, DMD (S/A fan 45x10)	505-1028-xx	
Elevator actuator (S/A, foot, mech)	505-1085-xx	
Top case (Housing, Top, D3)	505-1259-xx	Requires I/O panel label, #020-1486-xx.
Bottom case (Assy., bottom, D3)	505-1260-xx	Requires certification label, #020-1475-xx, model label, #020-1477-xx and power rating label, #020-1487-xx.
Keypad (S/A, keypad, D3)	505-1338-xx	
Color wheel	525-0037-xx	Includes glass color wheel and drive motor.
Speaker (S/A speaker, D3)	526-0116-xx	
Optical engine (Engine, optical, zoom, SGA, .7" DDR)	530-0388-xx	Includes projection lens, color wheel and color wheel sensor ECA

Hardware Kit Contents

Below is an alphabetically arranged list of the contents of the hardware kit (410442).

Part Name	Quantity	Notes
Bracket, Kensington lock	1	Metal bracket reinforces Kensington lock recess in bottom case
Foot, rubber	1	Adheres to bottom case
Gasket, power supply	1	Paper insulator beneath power supply
Gasket, power supply/ballast	1	Nylon insulator between ballast and power supply boards
Jack screw, #4-40	1	Retains connector in M1 port
Nut, knurled, 3.5mm jack	1	Retains I/O EMI shield over audio jack
Rivet, plastic retainer	4	Fastens ballast to standoffs on power supply
Screw, M2.5x5mm Torx w/washer	2	Fastens color wheel to optical engine
Screw, M2.5x5mm, Torx	5	
Screw, M2x3.6mm, Torx	3	
Screw, M3x6, slotted	3	Secures the lamp module in the projector
Screw, M3x8, pan head w/washer, Torx	1	Fastens power supply to bottom case at metal threaded insert
Screw, Plastite, M2.5x41.5mm, Torx	3	Fastens bottom case to top case
Screw, Plastite, M2.5x5mm, Torx	2	
Screw, Plastite, M3x7mm Torx	7	
Shield, color wheel	1	Plastic shroud encloses glass color wheel
Shield, EMI	1	Lays in bottom case beneath optical engine and power supply
Shield, I/O EMI	1	Surrounds I/O ports
Shield, M1 port EMI	1	Surrounds M1 port

Standard Accessories

Below is a list of accessories packaged with the projector. See Optional Accessories on the Toshiba web site for a complete list of optional accessories.

Description	Part Number	Notes
User's Guide (Manual, Users, TDP-P5)	010-0341-xx	For model TDP-P5-US
User's Guide (Userguide, Toshiba, TDP-P5J)	010-0369-xx	For model TDP-P5-J
Quick Start Card (QS TDP-P5)	009-0645-xx	For model TDP-P5-US
Quick Start Card (Quick Start Card, Toshiba, TDP-P5J)	009-0669-xx	For model TDP-P5-J
Lens Cap (S/A, Lens Cap)	505-1120-xx	
Lens cap retainer (Wire, lens cap)	321-0192-xx	Secures lens cap to projector
Audio cable (Cable, Audio Jack/Jack, 3.5MM, 2MM, X350)	420006	1/8" (3.5mm) mini-jack (stereo) each end
Audio/video cable (Cable, Audio/Video, 3.5MM, Jack/RCA, 2M)	420072	3 RCA jacks (composite video, L+R audio) to RCA (composite video) and 1/8" (3.5mm) mini-jack (stereo audio)
M1-A cable (Cable, M1, VGA+USB)	210-0232-xx	Analog M1-A to USB and VGA
Carrying case (Softcase w/pouch, Toshiba)	110-0388-xx	Soft-sided case with pouch for accessories
Remote control w/trackball (Batmouse IV Trackball, Toshiba)	200160TDP	Includes built-in laser pointer and 2 AA batteries
M1 to RCA adapter (Adapt, SCART to RCA)	301130	Converts RCA inputs (composite, left & right audio) to M1 connection
Lamp Module (Assy, Lamp Module, D3 Toshiba)	505-1291-xx	Installed in projector.
North American Power Cord (US Power Cord, D2 &D3, 3 Pole)	420046	For US product destinations only
European Power Cord (Power Cord Eur 3 Pole, 2M)	420045	For European product destination countries only
Japan Power Cord (PowerCord, Japan/C5)	210-0240-xx	For Japanese product destinations only